THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

Vol. XXXVI. No. 909.] LONDON, OCTOBER 12, 1880. [32nd Year. Price 6d.

GAS PURIFICATION
BY
OXIDE OF IRON.

COOKE BROS.,

CENTRAL DEPÔTS:
CO. DONEGAL, IRELAND;
LONDON DEPÔT:
ERITH,
OFFICES:
2, CROSBY SQUARE,
LONDON, E.C.

GENUINE TORBAY PAINT
And SPECIAL GASOMETER PAINT.
Several Prize Medals. Established over 20 Years.
These Paints are now used by all the London Gas Companies and most of the principal Country Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
Supplied, mixed ready for use, or in paste, as desired.
TORBAY PAINT COMPANY.
Proprietors: STEVENS & CO.,
21, GREAT WINCHESTER STREET, LONDON.
Works: BRIXHAM, TORBAY.

TUBES.
FIRST PRIZE SYDNEY EXHIBITION, 1880
Tubes and Fittings for Gas, Steam, Water, and Hydraulic purposes, plain, galvanized, white enamelled inside, or coated by Dr. Angus Smith's process, or oxidized by Prof. Barff's patent process. Gas-fitters tools, brass cocks, &c.
JOHN SPENCER,
VULCAN TUBE WORKS,
WEST BROMWICH, STAFFORDSHIRE,
& 97, CANNON ST., LONDON.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas-Retorts and other Objects in Fire-Clay," and they were also awarded at the International Exhibition of 1862, the Prize Medal for "Gas-Retorts, Fire-Bricks, &c., for Excellence of Quality."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Jos. Cowen & Co. are the only Manufacturers of Fire-Bricks and Clay Retorts at Blaydon Burn.

JOHN RUSSELL & CO.,
LIMITED,
Established at the commencement of Gas Lighting,
Manufacturers of
TUBES AND FITTINGS.
THREE PRIZE MEDALS,
Paris, 1878.
Head London Office:
145, QUEEN VICTORIA STREET.
ALMA TUBE-WORKS, WALSALL;
OLD PATENT TUBE-WORKS, WEDNESBURY.

JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
Manufacturers of
WET AND DRY GAS-METERS,
Licensees and Manufacturers of
HUNTS
PATENT COMPENSATING METERS,
STREET-LAMPS, &c., &c.
Established 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM,
Manufacturers of
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
Sugar, Saltpetre, and all kinds of Pans.
Roofs, Girders, and Bridges, and General Smith's Work.
London Offices: 97, CANNON STREET—
JAMES E. & SAMUEL SPENCER, Agents.

THE
"OTTO" GAS-ENGINE,
From ½ to 40 H.P. ind.
See Page 558.

CROSSLEY BROTHERS,
MANCHESTER AND LONDON.

THE
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
AGENT:
JAMES M'KELVIE,
HAYMARKET,
EDINBURGH.
ESTABLISHED 1840.

GEORGE GLOVER AND CO.,

PATENTEES OF THE
NATIONAL STANDARD GASOMETERS
AND MANUFACTURERS OF
IMPROVED DRY GAS-METERS.
GOLD MEDAL. HIGHEST AWARD.

INTERNATIONAL EXHIBITION,
SYDNEY, 1880.
RANELAGH WORKS, ROYAL AVENUE, CHELSEA, LONDON, S.W.
1, LANCASTER AVENUE, MANCHESTER.
Foreign Agents: DAHL BROS., Copenhagen; A. FAAS & CO., Frankfort-on-Maine; W. HOVEN & SON, Rotterdam; COPLAND & M'LAREN, Montreal; A. DEMPSTER, 57, Elizabeth Street, Melbourne.

WELLINGTON TUBE WORKS,

GREAT BRIDGE, TIPTON, STAFFORDSHIRE.

JOSEPH AIRD,

GAS, STEAM, AND HYDRAULIC TUBES AND FITTINGS.

DANIEL HOWARD,

(Successor to the late BENJ. WHITEHOUSE),

GASHOLDER AND BOILER WORKS,

WEST BROMWICH, NEAR BIRMINGHAM (Established 1765),

MANUFACTURER OF

TELESCOPIC AND SINGLE GASHOLDERS,

WROUGHT AND CAST-IRON TANKS FOR DITTO.

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS, AND ALL KINDS OF GAS APPARATUS.

WROUGHT-IRON ROOFS, BRIDGES, GIRDERS, ETC.

STEAM, HOT WATER, AND RANGE BOILERS, TANKS, CISTERNS, BOATS,

AND ALL KINDS OF WROUGHT-IRON WORK.

Drawings, Specifications, and Estimates supplied on application.

GOLDSMITH'S PATENT SIGHT WATER-LINE INDICATING GAS-METER.

MANUFACTURED BY GUEST AND CHRIMES,

FOUNDRY AND GENERAL BRASS WORKS, ROTHERHAM;

AND 95, SOUTHWARK ST., LONDON, S.E.

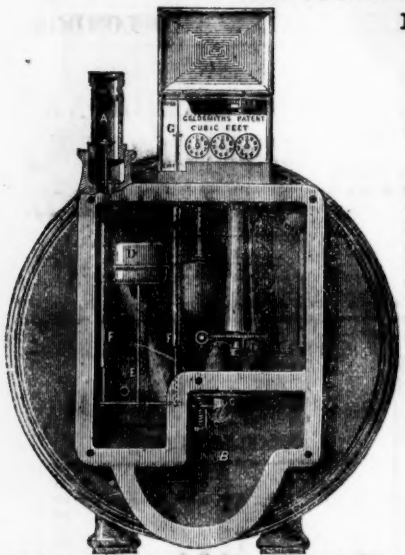


FIG. 1.—Three-light Meter, One-sixth Size.

Fig. 1 is a Meter with front removed to show the arrangement and connection of the Indicator and Valve.

Fig. 2 is front view of Index, with cover up.

The principal object of this invention is to render the water-line in the reservoir at all times visible. It will be seen, by reference to the illustrations, that this is accomplished in the following manner:—On the dial are the words "Open" and "Shut," and attached to the float is the pointer G, which rises and falls with the water-line in the reservoir. If the pointer is at "Open," it shows that the valve is open, and that the reservoir is full. If it is at "Shut," it shows that the reservoir is empty, and that the gas will be shut off.

The following ADVANTAGES will be obvious:—

1. The Inspector can see at a glance if the Meter requires water.
2. No more water than is required need be added, and therefore no water has to run out.
3. The Meter Inspector will be spared a great deal of his most objectionable work, and he will save a great deal of time and trouble.
4. The consumer will not always have to be asked for water, nor will he have to endure the unpleasant smell caused by waste water being run out.

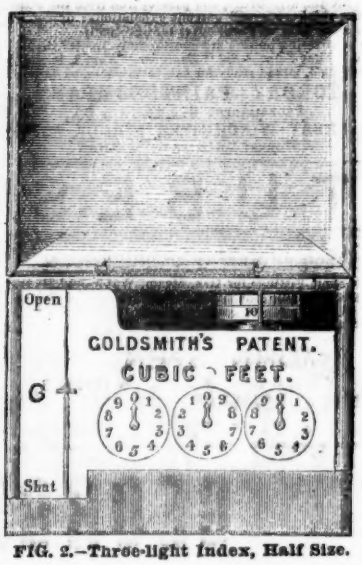


FIG. 2.—Three-light Index, Half Size.

TRADE MARK.

THE MEDAL FOR 1862.

The only Prize Medal awarded for TUBES & FITTINGS.

CROWN TUBE-WORKS,

WEDNESBURY, STAFFORDSHIRE.

WAREHOUSE: SOUTHWARK STREET, LONDON.

JAMES RUSSELL & SONS, LIMITED,

PATENTEES & FIRST MAKERS OF WROUGHT-IRON TUBES,

ONLY MAKERS OF HOMOGENEOUS METAL TUBES.

MANUFACTURERS OF

TUBES and FITTINGS for GAS, STEAM, and WATER;

LAP-WELDED, LOCOMOTIVE, MARINE, and other BOILER TUBES;

HYDRAULIC TUBES, BEDSTEAD TUBES, WELL TUBES, TELEGRAPH POSTS, COILS, &c.,

GAS-FITTERS TOOLS, VALVES, COCKS, &c.

THOMAS PIGGOTT & CO.,

(Established 1822,)

SPRING HILL, BIRMINGHAM.

MANUFACTURERS OF

TELESCOPIC & SINGLE GASHOLDERS,

CAST & WROUGHT IRON TANKS FOR DITTO;

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

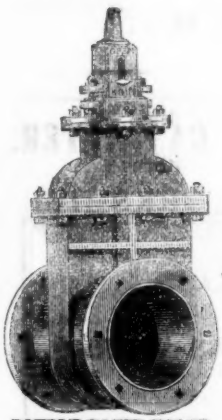
By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

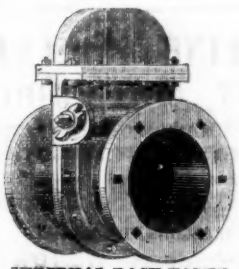
Drawings, Specifications, and Estimates supplied on application.

LONDON OFFICES: 97, CANNON STREET—JAMES E. & SAMUEL SPENCER, AGENTS.

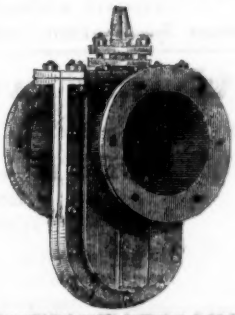
C. & W. WALKERS' GAS-VALVES.



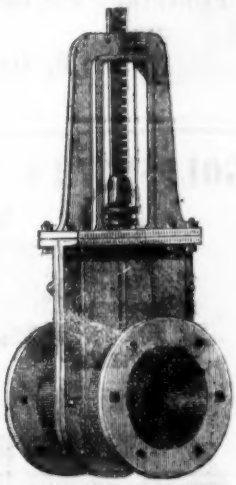
DOUBLE-FACED VALVE SPECIALLY FOR PURIFIERS.



INTERNAL RACK-VALVE WITH STEEL PINION, FOR GENERAL USE.



UNDERGROUND SCREW-VALVE FOR SHALLOW STREET-MAINS.



ORDINARY RACK AND PINION VALVE.

MIDLAND IRON-WORKS,

DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

BAILEY'S FLY WHEEL STEAM PUMPS,
SIMPLE & STRONG,
WITH No MYSTERIOUS VALVES.
W. H. BAILEY & CO HYDRAULIC ENGINEERS,
ALBION WORKS, SALFORD, MANCHESTER.

Prices of Bailey's Double-Acting Steam-Pumps.

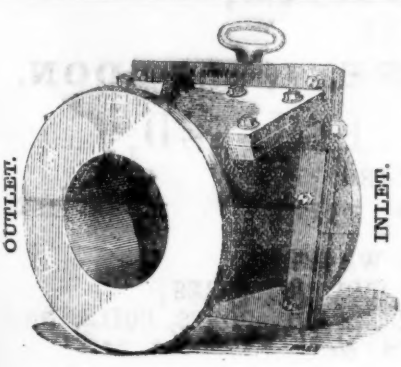
No.	Diameter of Steam Cylinder.	Diameter of Pump.	Length of Stroke.	Gallons pr. Hour. Approx.	Price.
	Inches.	Inches.	Inches.	At Slow Speed.	£
A 1	4	2	6	850	18
B 2	6	3	10	1,940	25
C 3	6	4	10	2,600	30
D 4	8	4	10	3,150	40
E 5	6	6	10	7,200	40
F 6	8	6	10	7,200	50
G 7	10	6	12	7,200	60
H 8	8	8	10	14,000	65
I 9	10	8	12	14,000	75
K 10	12	8	15	14,600	90
	10	10	15	21,000	110
	12	10	15	21,000	125

NOTE.—*At quick speed these pumps will generally deliver double the quantity specified.*

BAILEY'S HOT-AIR ENGINES,

From ¼-horse to 4-horse Power. Particulars on application. We also make Hot-Air Pumping Engines, and every description of Hydraulic Work.

W. H. BAILEY & CO., ALBION WORKS, SALFORD, MANCHESTER.



IMPROVED

BYE-PASS VALVES

FOR GAS-MAINS,

Fitted with Knocker, so that the Valve can be easily opened by a handle should it stick.

B. DONKIN & Co.,

SOUTHWARK PARK ROAD, BERMONDSEY, LONDON.

GAS PURIFICATION

BY

OXIDE OF IRON.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.

JOHN WM. O'NEILL, Managing Director.

THE

LANCASHIRE GAS-METER COMPANY, LIMITED,

FALCON STREET, ASHTON ROAD,

OLDHAM

MANUFACTURERS OF

WET AND DRY GAS-METERS,

STATION-METERS, GOVERNORS,

LAMP GOVERNORS & TAPS, PRESSURE-GAUGES, MAIN THERMOMETERS,

ETC., ETC.

ROBT. DEMPSTER & SONS,

GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE.

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS;

CONTRACTORS FOR THE

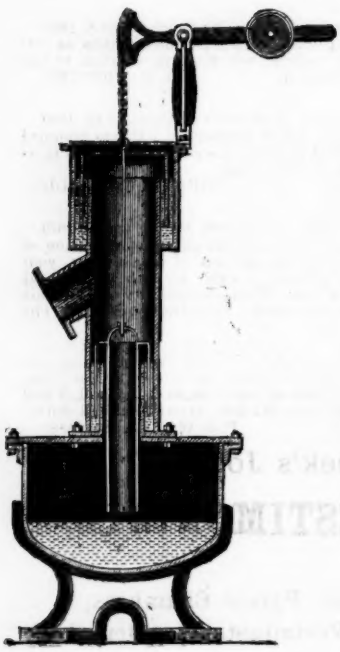
ERECTION OF PUBLIC AND PRIVATE GAS-WORKS.

Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



The following Testimonials, as to five years constant working of this Patent Removable Dip, have been received:—

Metropolitan District Asylum Gas-Works, Caterham, Surrey, Jan. 15, 1874.

Messrs. CHANDLER and SONS.

DEAR SIRS,

In reply to your inquiries, I beg to inform you that since I have used your Patented Dips (ten in number), I find my make has increased over 1000 cubic feet per ton of coal carbonized, my usual make being 9070 cubic feet before using your Dips, and 10,150 cubic feet since using them.

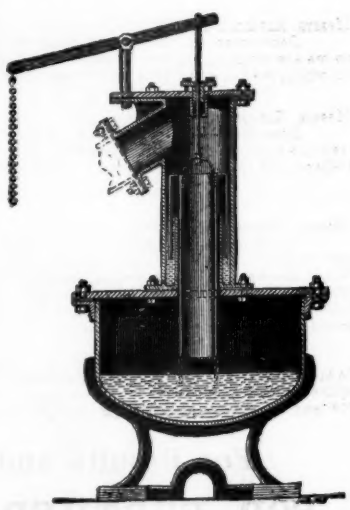
Metropolitan District Asylum Gas-Works, Caterham, Surrey, Dec. 30, 1879.

Messrs. CHANDLER and SONS.

DEAR SIRS,

In reply to your inquiry, it is with very much pleasure thatI endorse every word of my letter of Jan. 15, 1874; and I may add that from the date the Patent Dips were fitted, they have worked perfectly, and there is very little carbon deposited in the retorts, in consequence of the lower pressure.

Yours faithfully,
(Signed) W. CRICKMAY,
Memb. Soc. Engineers.



APPLICATIONS TO BE MADE TO

Messrs. CHANDLER & SONS,

104, NEWINGTON CAUSEWAY, S.E.

KIRKHAM, HULETT, & CHANDLER, LIMITED.

PATENT "STANDARD" WASHER-SCRUBBER,

FOR

GAS PURIFICATION,

TAKES OUT EVERY TRACE OF AMMONIA AND A LARGE QUANTITY OF CARBONIC ACID AND SULPHURETTED HYDROGEN BY ONCE PASSING THROUGH THE MACHINE.

AMMONIACAL LIQUOR OBTAINED OF ANY REQUIRED STRENGTH.

The Cost of the Machine defrayed by the Ammonia obtained in Twelve Months. It requires very little attention, and cannot get out of order.

These Machines, which contain from 3200 feet to 65,000 feet of Wetted Surface, are supplied to the following Gas-Works:—

	Feet per Day.		Feet per Day.
The Gaslight Company, London—		Glossop Company	300,000
Beckton	5,000,000	Holywood Company	125,000
Bromley	7,000,000	Heywood Local Board	600,000
St. Pancras	3,000,000	Leeds Corporation	2,000,000
Bradford Corporation	1,000,000	Leominster Company	150,000
Bremen	150,000	Maidstone Company	1,000,000
Buxton Local Board	250,000	Phœnix Company, Greenwich	2,500,000
Dukinfield Local Board	500,000	„ „ Vauxhall	3,000,000
Driffield Company	100,000	Woolwich Equitable Company	400,000
Goole Company	250,000	Yeadon Company	500,000

And many in course of Construction, among others—

Feet per Day each.	For	Feet per Day each.	For
Four for 3,000,000	Corporation of Leeds.	One for 1,000,000	West Bromwich Improvement [Commissioners.
Three „ 1,750,000	Corporation of Salford. [Station.		
One „ 2,500,000	The Gaslight Co., Shoreditch	One „ 750,000	Radcliffe and Pilkington Gas Co.
Two „ 1,250,000	The Gaslight Company, Beckton.	One „ 500,000	Oldbury Local Board.
One „ 3,000,000	London Gas Co., Nine Elms.	One „ 150,000	Falmouth Gas Company.
One „ 1,250,000	Corporation of Nottingham.	One „ 250,000	European Gas Company, Rouen.
One „ 2,000,000	Cheltenham Gas Company.	One „ 200,000	Deal Gas Company.

TESTIMONIALS.

Messrs. Kirkham and Hersey. *The Gaslight and Coke Company, Beckton, North Woolwich, June* 8, 1880.

Gentlemen,—I enclose you some particulars of the working of your Washers here, and I intend having some more experiments made, as just now we are working the first Washer with liquor, and the second with water. Of course the fact of our having ordered two more in addition to the four which we have in use is a sufficient indication of my opinion of the value of the Washer. (Signed) G. C. TREWBY.

Messrs. Kirkham and Hersey. *South Metropolitan (late Phœnix) Gaslight Company, Engineer's Office, June* 19, 1880.

Dear Sirs,—The "Standard" Washer which you supplied for use at our Vauxhall station has afforded me entire satisfaction. It was designed to remove the ammonia from 3 million cubic feet of gas per day, and during the past winter it did so with a good working margin to spare. It is as excellent now in workmanship as in design, and is well worthy of the general acceptance with which it appears to be meeting.

I am, faithfully yours, (Signed) CORBET WOODALL.

Messrs. Kirkham and Hersey. *Phœnix Gaslight and Coke Company, Office, Greenwich, S.E., Aug.* 12, 1879.

Gentlemen,—In reply to your inquiry, one of your Patent Scrubber-Washers to purify 100,000 cubic feet per hour was put into operation at these works on the 1st of June. At the same moment the whole of our Scrubbers, equal to 28,000 cubic feet, were thrown out of use, leaving your Washer the whole work of freeing the gas from Ammonia. This it has done to perfection up to date. With 10 gallons of water to each ton of coal carbonized passing through it we get a clean test at the seventh chamber, leaving four chambers margin for extra work. The mean quantity of Ammonia in the inlet (fixed and free), obtained from a large number of tests, was 241 grains per 100 feet of gas. On the outlet—Free Ammonia—Nil. The quantity of water used is 10 gallons per ton of coal carbonized. The strength of liquor as follows:—

Chamber No.	1	2	3	4	5	6	7	8	9	10	11
Strength of liquor—ounces	Nil.	Nil.	Nil.	Nil.	0·4	1·0	2·2	3·5	5·5	8·25	12·5

We are working five revolutions per minute. It takes out all the free Ammonia, reduces the carbonic acid and sulphuretted hydrogen 30 per cent., requires a very small amount of power to drive, and altogether is, in my opinion, the best machine for the purpose yet invented, and will, I feel confident, ere long, entirely supersede the Scrubbers of to-day. I am glad to find you are going to fix one of these Washers at our Vauxhall works.

(Signed) P. J. WATES, Engineer.

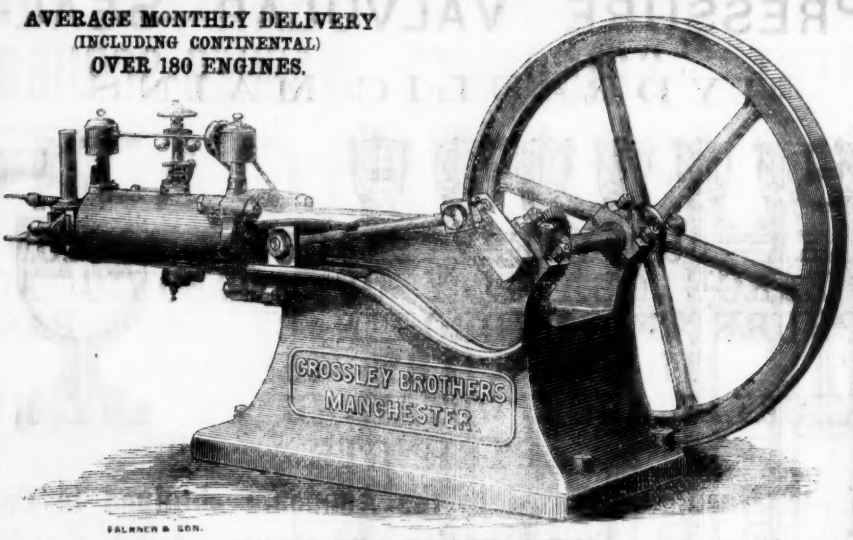
For Results and other Testimonials, see next week's Journal.

FOR FURTHER PARTICULARS AND TESTIMONIALS, ADDRESS MESSRS.

KIRKHAM, HULETT, & CHANDLER, LIMITED, 59 & 60, Palace Chambers, Bridge St. Westminster, London, S.W.

AN ENGINE WHICH WORKS WITHOUT A BOILER OR STEAM

AVERAGE MONTHLY DELIVERY
(INCLUDING CONTINENTAL)
OVER 180 ENGINES.



These Engines are used at the following Gas-Works:—Birmingham, Brentford, Bucharest, Bishop Stortford, Driffield, Dundalk, Dundee, Dublin, Huddersfield, Hinckley. London—London Gas-Works, Phœnix Gas Co., Gaslight and Coke Co., South Metropolitan Gas Co., Commercial Gas Co., Crystal Palace District. Leominster, Edinburgh and Leith, Ludlow Union, Lancaster, Maidstone, Nuneaton, Northampton, Shanghai, Sheffield, Worcester, Wantage, &c.

Over 2500 already delivered.

Very numerous Testimonials from Users, including Engineers, Men of Science, and others, on application to the makers.

No trouble with Coal, Ashes, Smoke, Insurance, Water, or constant attendance.

No Glands to pack, or Water Gauges and Steam Gauges to watch.

STARTS AT A MOMENT'S NOTICE.

THE "OTTO" SILENT GAS-ENGINE,

From ½ to 40 Horse Power Indicated.

(Otto and Crossley's Patents, 1876 and 1877.)

THEY ARE USED FOR ALL KINDS OF PURPOSES, CHIEFLY FOR EXHAUSTERS, SCRUBBERS, & PUMPS.

DELIVERED IN MANCHESTER. CASES NOT CHARGED IF RETURNED FREE.

PRICES INCLUDE CAST-IRON STAND, TURNED FLY-WHEEL, AND DRIVING PULLEY; WATER-VESSEL, SEVERAL DUPLICATES, AND GAS-FITTINGS (EXCEPTING METER AND PIPES).

WORKS AND HEAD OFFICES:
Gt. Marlbro' St., Gloster St.

CROSSLEY BROTHERS,
MANCHESTER.

LONDON HOUSE:
116, Queen Victoria St., E.C.

MECHANICAL CONDENSATION.

The undersigned has arranged with Messrs. Pelouze and Audouin the exclusive agency for their patented system of Condensation, in Great Britain and the Colonies.

The following are some of the advantages which this philosophic mode of arresting liquefiable vapours possesses:—

1. It acts irrespective of temperature.
2. It requires no motive power, but automatically adapts itself to production.
3. It may be fixed directly after the hydraulic main, by which prolonged contact of the gas with tar is avoided, and the highest standard of illuminating power is obtained which the coal is capable of giving; or it may be fixed directly after an ordinary air condenser, when it will arrest the vapoury globules which cooling alone will not stop, and the production of tar and ammonia water is thereby increased.
4. It effects a considerable saving in purification, through no tar getting to the material to clog its action.
5. It entirely supersedes the necessity of scrubbers; and if wet sawdust be used in a purifier, washers also are unnecessary.
6. It occupies but little space, and avoids that which is now considered a disadvantage—the too much cooling, scrubbing, and washing of gas.

Further particulars may be obtained of

GEO. BOWER, St. Neots, Hunts.

NOTE.—*Gas-works contracted for complete, or apparatus supplied in detail from the retort to the burner. "The Gas and Water Engineer's Book of Reference," post free, 5s. "Handy Abstract of the Public Health Act, 1875," post free, 1s.*

PARIS EXHIBITION, 1878.

THREE MEDALS
AND
HONOURABLE MENTION
HAVE BEEN AWARDED TO
JOSEPH CLIFF & SONS

For their Various Exhibits, amongst which is a

SILVER MEDAL
FOR THEIR
PATENT MACHINE-MADE
RETORTS AND FIRE-BRICKS,
Being the Highest Honour given for this class.

Established

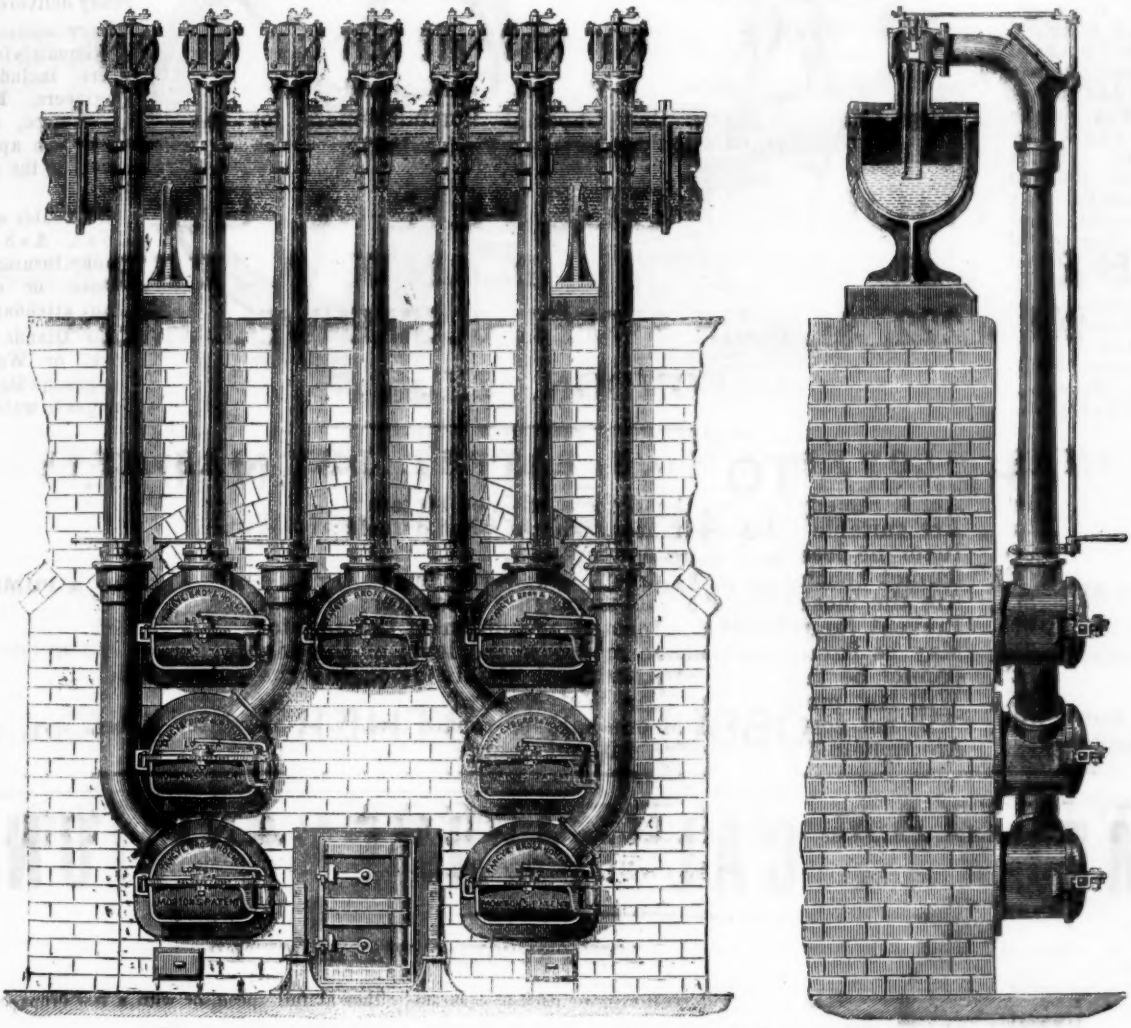
1795.

JOSEPH CLIFF & SONS,
THE ORIGINAL
WORTLEY FIRE-BRICK WORKS,
NEAR LEEDS,

London Wharf: No. 4, inside Great Northern Goods Station, King's Cross, N. Liverpool: Leeds Street.

SPECIAL NOTICE.—Our Patent Machine-Made Retorts have now been thoroughly tested, and have proved themselves infinitely superior to those made by hand. At several large works it has been settled, beyond question, that, owing to the compactness and general excellence, more gas is sent to the gasholder from each ton of coal carbonized than is the case with hand-made Retorts.

HOLMAN'S PATENT
NON-PRESSURE VALVULAR SEAL-PIPES
FOR
HYDRAULIC MAINS.



The salient features of the above arrangement are as follows:—

1. The Seal is instantaneously opened and closed from the stage by the stokers.
2. There are only two positions for the actuating lever: one when the Seal is opened during the period of carbonization, the other when it is closed for drawing and charging the retort.
3. The retort can never be blocked, beause the port directing the gas *through* the Seal is always opened, and the port permitting the gas to *pass* the Seal *direct* into the hydraulic main is also open while the retort is at work.
4. The manager and stokers can always see at a glance, by the position of the lever, whether the retort is duly unsealed while carbonizing its charge.
5. There are no extraneous seals, stuffing-boxes, hinges, screws, chains, pulleys, springs, teeth, or other complication belonging to the valves; they are made plain and strong for rough use, and will last many years without renewal.
6. The valve faces are always covered and never separated, hence no foreign matter can put them out of action.
7. They are positive, reliable, interchangeable, free from all the uncertainty of automatic arrangements, and low in price.
8. No extra pipes or connections are required, because the Valvular Seal-pipe is self-contained in the single branch of the ascension-pipe, which stands on the hydraulic main, and is easily accessible by removing an ordinary cover secured by two bolts only.

(238) TWO HUNDRED AND THIRTY-EIGHT HOLMAN'S PATENT VALVULAR SEAL-PIPES are being fitted to the Hydraulic Mains at the Radford Station of the Corporation Gas-Works at Nottingham.

(84) EIGHTY-FOUR more are being fitted to the Mains in the New Retort-House of the Gas-Works at Brentford, and they can be readily applied to existing Hydraulic Mains generally.

They are to be fitted to the Hydraulic Mains of the New Retort-House at the LONDON GAS-WORKS, and at other large stations.

Mr. MORTON writes in the following terms, under date of Feb. 3, 1880:—

"Gentlemen,—I have determined to use your HOLMAN'S PATENT NON-PRESSURE VALVULAR SEAL-PIPES in our new Retort-House. Will you, in the meantime, send me, as soon as you can, four as you are now making them. I expect to hear of a large demand for these Pipes. I like the idea of always maintaining a passage through an ordinary dip."

ESTIMATES for Retort Work, including Mouthpieces fitted with Morton's Patent Self-Sealing Lids and Holman's Self-Sustaining Cross-Bars and Fastenings, Hydraulic Mains and Ascension-Pipes, fitted with Holman's Patent Non-Pressure Valvular Seal-Pipes complete (as per accompanying illustration), will be forwarded to Engineers on receipt of particulars of intended erections. or re-setting of Retorts during the current or ensuing season.

Engineers preparing Specifications will be furnished with Tracings and all necessary data on application.

Sole Makers:

TANGYE BROTHERS AND HOLMAN,
HYDRAULIC AND GAS ENGINEERS,
CORNWALL HOUSE, QUEEN VICTORIA STREET, LONDON, E.C.

London, 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

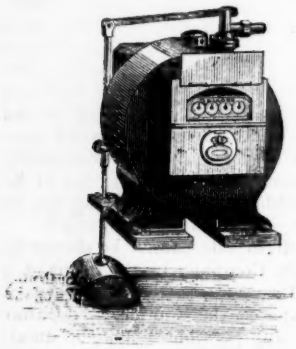
LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS.

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON AND CO.

(ESTABLISHED 1816.)



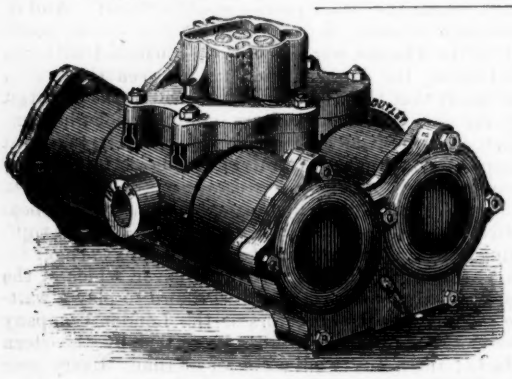
LOW-PRESSURE WATER-METER.

This Meter will register with perfect accuracy, either at full speed, or with a few drops only passing through it.

It must be placed over the cistern to be supplied, and the water, after being measured, will fall from the outlet into the cistern below.

Each Meter is fitted with a ball-valve, so made that it can be adjusted to shut off the supply a the inlet when the water reaches any required height in the cistern.

The 100-gallon Meter is fitted with a cistern holding about three or four gallons, and may be fixed inside a house, free from the effects of frost, and requires no attention after once being fixed.



HIGH-PRESSURE WATER-METER.

The Union Water-Meter, of which an external view is here given, is of the positive class—*i.e.*, a Meter in which a measuring chamber is alternately filled and emptied, each filling being duly recorded. It is formed of two cylinders, with double pistons in each, having a rotary-valve of peculiar construction, which is worked from cams on the piston-rods.

It is claimed for this Meter, among its advantages over other Piston Meters in use, that it is extremely small and compact, and that its durability and accuracy have been proved by the fact that upwards of 20,000 of them, of various sizes, are in successful operation in the States. In England the instrument has been fully tested by several Water Engineers of eminence, and pronounced by them as a reliable and satisfactory register of water supply; it is also economical in cost.

ALL METERS are TESTED with 60 lbs. pressure before they are sent out.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

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TO CORRESPONDENTS.

J. O. N. R.—*Have not been able to do anything this week with the "Note" you have kindly sent. Shall probably refer to it next issue.*

G. D. M.—*Too late for use this week.*

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 12, 1880.

Circular to Gas Companies.

THE ordinary half-yearly meeting of the London Gaslight Company was held on Wednesday last, when the Directors report and the statement of accounts, which will be found in another column, were adopted, and the full statutory dividends declared. Considerable curiosity prevailed, up to the time of the meeting, as to the announcement, if any, which the Governor might have to make concerning the attitude of the Board with reference to amalgamation with either The Gaslight and Coke Company or the South Metropolitan Company, or perhaps both. As it happened, Mr. Major Rohde Hawkins did not mention this burning question at all until it had been brought forward by one or two other speakers, and then his utterances were much of the same character as the remarks made by him on the subject at more than one previous meeting. Mr. Hawkins has done us the honour to adopt a phrase used in these columns, when commenting on the report in a recent number. We then said that it had a fine old flavour, not tinged with mustiness; and now, while adhering to that description of the report, we cannot conscientiously say that all the Governor's arguments and remarks were, although old, entirely free from the latter taint. We have no fault to find with the subject matter of the greater portion of the Governor's introductory speech. His references to the Company's business were marked with well-founded feelings of contentment; the announcement of a reduction in price was satisfactory; and his warning to timid Shareholders to preserve their confidence in the stability of gas property, in view of a possible revival of electric "scares," one of which is perhaps about due, was clear and well timed. If any panic should set in among the proprietors of London gas stock during the dark days of the coming winter, it will not be the fault of the Governor of the London Gaslight Company, and any Shareholders who may be foolish enough to disregard his counsel will richly deserve the loss which they will in that case suffer. But when Mr. Hawkins complacently bids his friends and constituents to believe in the impregnable safeguards of high prices and low quality, by the aid of which the Shareholders of the London Company are to revel in maximum dividends when the miserable Proprietors of the other Metropolitan Companies, now rejoicing in bloated dividends, are reduced to pauperism by the action of the sliding scale, he is making too great demands upon our credulity. We cannot think that the Governor has ever contemplated, as a serious possibility, the spectacle of one among the Metropolitan Gas Companies attempting to exist by charging 4s. 6d. per thousand feet for twelve-candle gas. As Mr. Hobson put it in his broad and politic speech, the days when this sort of thing would have been endured are gone for ever; and to invite confidence in a strength depending on powers which it would be suicidal to employ, is indeed an invitation to dwell in a fool's paradise. The strength of the London Company does not depend on any such battery of rusty weapons as the Governor would apparently have us believe in, but rather in the ability to make handsome profits by selling gas as good and as cheap as any of their neighbours, and to carry on a sound and elastic trade within the district which belongs to them.

It is impossible to maintain that the London Company, dividing ten per cent. only, are one whit stronger in consequence than either of the other Companies who now divide nearly two per cent. more. But there is, at least, one contingency in regard to which the value of the Companies would be held to depend directly on the amount of their dividends. We allude to the possibility of purchase by a Central Authority. The President of the Board of Trade has had a great deal of experience in the transfer of gas undertakings to municipal authorities, and if, in any scheme of a united Municipality for the Metropolis which he may have in contemplation, the transfer of the gas and water undertakings should be included, the magnitude of the interests involved would not have any terrors for him, for he knows very well that these transactions, great or small, when properly conducted, can be made to pay. In such an eventuality as this (and none would deem it chimerical), can it be doubted which class of Shareholders—those receiving ten, or those obtaining twelve per cent.—would fare the better?

If the system of maximum dividends cannot be shown to be advantageous to the London Company in the event of a general extinction of all the Metropolitan Gas Companies, it is no less difficult to see in what way the Company's peculiar legal powers will serve them in any possible scheme of amalgamation to which the other parties would consent. And if, as the Governor believes, the two adjacent Companies, north and south of the Thames respectively, are consumed with the desire of dividing the London Company between them, it is not at all likely that they will be influenced in the slightest degree by the phantom parliamentary immunities of the Company which, insubstantial as they are at present, would at once disappear upon amalgamation. The value of the property to the purchasers would be just what it could be made to yield under the regulations which would be brought to bear upon it directly it changed hands. But is the Governor right in assuming that the neighbouring Companies are so eager for what the Yankees call a "deal"? and, moreover, which of the two sides, vendor or purchaser, can best afford to play a waiting game? Whether the Directors of the London Company like it or not, the question is already settled by the stern logic of facts; the event is but a matter of time. Every year brings the Company nearer the end—submission to a revision of powers, or amalgamation. In the matter of value to an amalgamating Company, the London property is worth less now than it was last year; it is worth more now than it will be a twelvemonth hence. Every year that the Directors of the

London Company cling to their ten per cent. maximum, and debar themselves of more through fear of the sliding scale or reluctance to amalgamate, brings them nearer the time when their choice will have to be made, however reluctantly, between the two courses which all their neighbours have already taken. Will it be the former alternative—an independent existence under the sliding scale? Scarcely; the struggle for an initial price would not result in placing the Company on equal terms with the other Companies in this respect. Then there is only one other result to be looked for, and it must be left to the intelligence of the Governor and his fellow-Directors to say whether they are likely to make a better bargain at some future time, when they cannot help themselves, or in the immediate future, when they will still retain a voice to be heard and respected in any possible settlement.

The abstract of the accounts of the Manchester Corporation Gas-Works for the year ending the 24th of June last has been issued, and, as usual, sets forth the transactions of the department in great detail. The Gas Committee have suffered from the depression which pervaded the trade of Manchester during the past year, the number of gas consumers in their district showing a decrease, as compared with the previous year, of 1042, or 1·41 per cent. The increase in the consumption of gas has, therefore, been proportionately affected, being only 0·38 per cent., as against the preceding year's increase of 8·02 per cent. Although the coke sales suffered to the extent of £1780, the Committee have benefited by the lessened cost of coal and cannel, and have saved £13,000 under this head. Besides this they have realized £7700 more for ammoniacal liquor under a new contract in force during the latter half of the year. This looks as if the Committee are taking good care of their business, as well they may, in view of the demands upon them. First of all, they defray the entire cost of the street lighting, amounting to £23,336 for the year; and they have to hand over to the Improvement Committee the very extravagant sum of £52,000. Then the interest on loans has to be met, amounting to £23,629, and there are a heavy depreciation charge and a sinking-fund to provide for. All these charges, in addition to the ordinary working expenses, make the balance appear on the wrong side of the profit and loss account—a circumstance rather satisfactory to us than otherwise, as it causes the reserve-fund to be drawn upon, though to a comparatively small extent (about £1600), to make up the amount payable to the Improvement Committee. The reserve is not large—only £18,775—for a concern having to pay considerably over £112,000 per annum in what, in the case of a Company, would be dividends and interest, and there is no doubt that in this class of liabilities the Manchester gas undertaking is loaded quite heavily enough, even for its present magnificent income. The new Bradford Road station figures in the accounts as having absorbed, up to Midsummer, no less than £343,635, all of which is entirely unproductive, and most of it will remain so for a considerable time, as it has already been for some years. Not much is said of this particular station in the Committee's report, but the reasons for keeping the construction of the works so long in hand seem to require at least an attempt at explanation. The illuminating power of the gas has been maintained on an average equal to 21·32 candles, but the presence of sulphuretted hydrogen is not unknown, and, on the whole, it may be said that the purity of the Manchester gas has not been commensurate with its brilliancy. This is, of course, owing to cramped and imperfect apparatus, and may be expected to be remedied in the near future. Manchester has long been subject to a very disjointed system of control in the matter of gas supply; but there are signs that an improvement in this respect is not far distant. A responsible official head has been given to the engineering and manufacturing department, and this step alone should ere long be fruitful of good results.

The proposal to reduce the price of gas by an equal amount—twopence per thousand feet—within and without the city boundaries is, we would fain hope, an evidence that the Gas Committee are awaking to a sense of the positive robbery of their customers which they have been carrying on for so many years, by making them bear the whole cost of the improvements within the city, and, later, of lighting the streets. These two impositions, amounting together to about tenpence per thousand feet, cannot, in our opinion, be supported by cogent arguments, except the vicious if plausible ones of use and expediency—two specious cloaks which in other matters have been made to cover a vast amount of ancient error. Why an inhabitant of the neighbourhood of Manchester should pay about a shilling more for his gas than is necessary, in order that Deansgate may be improved (?) or Piccadilly made to shine by night, is a query difficult to answer, except by the admission that the public authorities of the Free-trade city are obliged to resort to indirect taxation for a considerable portion of their corporate revenue. We own that the Gas Committee are not wholly to blame for this very unsatisfactory state of things. They probably do not reciprocate the fidelity with which the Improvement Committee cling to them, and would prefer to be accountable to their own customers for the profits they are able, by their skill and forethought, to realize. Popularity well earned is as dear to them as to any other of the chosen representatives of the ratepayers, most of whom are also gas consumers. But up to the present time they have sat down too tamely under the burdens laid on them by legislation of an obsolete type, instead of endeavouring to obtain independence with the aid of public opinion, which they might have taken more pains to foster, if necessary. We hope, however, that a new era is about to dawn for the gas consumers of Manchester, and that the Corporation will not long remain the great exemplar of all those purblind controllers of public gas undertakings who make the gas consumer a prey to all manner of extortion for the benefit of other people, and deny to him the consideration due to a ratepayer, and a brother.

The Town Council of Halifax have taken a most commendable step in the right direction, in reducing, by almost a third, the price of the gas supplied by the Corporation works. This action, of course, signifies that in Halifax the gas undertaking is in future to be worked for the benefit of the town, through the consumers, and no longer on the principle of aiding the rates by surcharging one section of the inhabitants. It is highly creditable to the Gas Committee, and to the Council who supported their recommendation, that they have had the courage to throw off the trammels of habit and surmount old prejudices, and by one act to proclaim their adhesion to the true principles upon which public property in gas should be administered. The Gas Committee will henceforth frame their annual estimates upon the basis of realizing, as nearly as may be, a profit of one per cent. only, the surplus, if any, to be credited to a stores account, which appears to be a form of floating capital. The immediate effect of this resolution will be to reduce the price of gas within the borough to 2s. 4d., as compared with the previous price of 3s. 4d. per thousand feet, and we shall not be surprised if the effect of this wholesale reduction prove to be the extension of the Committee's business beyond even their most sanguine expectations. The capital expenses of the Halifax undertaking are heavy in proportion to the consumption of gas, but this will soon be altered under the new dispensation. The works are equal to a largely-increased production, and there is now every prospect that their capabilities will be fully tested.

The Walsall Corporation are about to distinguish themselves by abolishing their borough rate for the ensuing quarter, ending next February. They intend to make up the deficiency in their corporate income by appropriating the sum of £7000, accumulated profits from the gas undertaking; the amount of the remitted rate being 1s. 3d. in the pound. It should be remarked that the estimated yearly profit of the gas-works is only £4000, the whole of which is handed over to the borough fund as a matter of course; but on the present occasion it will be seen that the undertaking is to be denuded of another £3000, accumulated surplus, in order that the ratepayers of Walsall may escape payment of rates for one quarter of a year. The decision of the Town Council to take the above-mentioned course does not appear to have been called in question by any one, so it may be supposed to have given satisfaction to everybody, for the time. It is not, however, to be expected that the gas consumers of Walsall will be better pleased than their fellows in other places, at being expected to pay rates for all the other inhabitants of the borough. There was a statement made by the Chairman of the Gas Committee, which gives us the impression that he, at least, is conscious of some imperfection in the means to secure the end favoured by the financiers of the Corporation. According to this gentleman, the district of Bloxwich, although charged sixpence per thousand feet more for gas than the price charged in Walsall proper, only returned about £500 to the gas department, while the same district would get back one-third of the £7000 bonus; in other words, Bloxwich contributes one-eleventh of the amount appropriated in lieu of rates, and receives in exchange one-third of it. When, in addition to this, it is considered that these amounts are probably contributed and

returned without the slightest relation being observed between contributors and recipients, it should be evident, even to the Town Council of Walsall, that there is a screw loose somewhere in their fiduciary arrangements, and that they are carrying on in a new shape the old game of robbing Peter to pay Paul. Meanwhile, people of an economical turn of mind may be led to consider Walsall a desirable place of residence, where the disagreeable infliction of rates can be escaped from, during some portion of the year at least, by the simple expedient of not burning gas.

The Stretford Gas Company are in trouble of an unusual kind. An inquiry into the affairs of the Company has been directed by the Salford Hundred Court of Quarter Sessions, upon the petition of certain consumers of the Company's gas, in accordance with the provisions of clause 35 of the Gas-Works Clauses Act, 1847, in which petition it was alleged, among other things, that the price charged for the gas was higher than it ought to have been. The Court appointed an Accountant in April last to examine the Company's books, and at a special sitting commencing last Wednesday the case was fully argued, upon the Accountant's report, before a Court presided over by Mr. W. H. Higgin, Q.C. The Company charge 3s. 6d. per thousand feet, and their gas has an illuminating power of twenty-two candles, so that, on the face of it, the consumers would not appear to have much cause for complaint. It is also made out, in the Company's defence, that the price is so low as to barely enable them to pay maximum dividends. Against this the petitioners contend that a reserve-fund should long ago have been formed to the full stututory amount, the interest on which would have helped to lower the cost of the gas; but that, instead of forming a reserve-fund with excess profits from time to time at their disposal, the Directors of the Company distributed these amounts among the Shareholders, by creating capital with them, and in other ways distinguished by more or less ingenuity in circumventing the provisions of the Act. To some of these allegations there was practically no defence, and, in fact, the best that could be done by the Counsel for the Company was to submit that the Court had no jurisdiction under the clause cited, which refers only to reserve-funds invested, and that as the Company had no invested reserve-fund at all, the provisions of the clause were inoperative. The Court postponed judgment until the 27th inst., after an expression of opinion on the part of the Chairman and another Magistrate that their power to deal with the matter was very doubtful. The whole proceeding is of considerable rarity, and if it should be decided in the present instance that the petitioners have no remedy, the curious spectacle will appear of a Company being successfully shielded from one provision of an Act of Parliament by the mere fact of having disobeyed another. By neglecting to observe clause 31 of the General Act, they may escape from clause 35; and as there is nothing expressly penal in the former clause it may be transgressed with impunity! If this be so, then, except a Company act straightforwardly and form a true reserve-fund with their surplus profits, nothing short of an opposition in Parliament will be of any service in regulating them as to price and profits, and even then they cannot be compelled to disgorge any illegal gains that a past generation of complaisant consumers may have permitted them to accumulate and divert to other uses than those contemplated by Parliament. The penalty, however, which an erring Gas Company would assuredly incur, as to their whole future existence, if, on applying to Parliament for further powers, malpractices of this kind could be proved against them, will probably be enough to deter, by anticipation, any Company from committing them. No Company under parliamentary control could carry on frauds of this nature except with the positive connivance of the public, which is simply impossible; and we should think that few would attempt anything of the kind. As to the particular case in point, we cannot, of course, express an opinion until the decision of the Court has been made known.

In a communication which appears in another column, Mr. George Livesey opens up afresh the question of high yields of gas from coal as compared with moderate rates per ton, with regard to their respective economy. The point as to the determination of the highest rate to which a given coal can be forced in carbonization, with due regard to the conflicting advantages of quantity, quality, and economy of working, is well made, and should secure general attention. That there is a maximum to be attained, if possible, but never exceeded, is evident upon the merest glance at the problem; but whether the advocates of the highest or lowest results commonly recorded are nearer the correct proportion, certainly needs settlement, or, at least, such attempts thereat as Mr. Livesey's challenge should be competent to evoke.

Mr. J. T. Jolliffe's paper on the "Utilization of Waste Heat "from the Retort-Flues for the Generation of Steam," read at the recent meeting of the North of England Gas Managers Association at Sunderland, was useful for its incidental information respecting the expenditure of fuel in producing steam for the ordinary operation of a gas-works, as well as for the narrative of the author's experiences in arriving at the proper position and setting for steam-boilers to be heated from the main flue of a retort-stack. It seems a somewhat strange proceeding to put a boiler into a spare arch, and then to bring down the heat to it from above, as first arranged by Mr. Jolliffe, and there can be small wonder that he found the draught from the settings to be deteriorated thereby. The top of the bench is certainly the best place for a boiler intended to be heated by the waste heat of the retort-settings. It is, however, curious that the author, having condemned a previous proposal to fix boilers in this position, on the ground of their inaccessibility, when through settings are in question, should, in his very next paragraph, admit having followed the same course with success, when he required additional steaming power. There is an apparent discrepancy here between the author's opinions and his practice, which is, we are sure, apparent only; but, as expressed in the language of the paper, the point of reconciliation is not very clear.

Dr. Williamson, the Chief Gas Examiner for the Metropolitan Board of Works, has issued his report on the quality of the gas supplied during the three months ending the 30th ult. by The Gaslight and Coke Company, the Commercial Gas Company, and the South Metropolitan Company. In all cases the illuminating power of the gas was considerably above the requirements of the Acts of Parliament. Sulphuretted hydrogen has not been present in the gas, and the proportion of sulphur in other forms never averaged fourteen grains per hundred cubic feet, and was generally much lower. This is, of course, considerably below the prescribed limits. Ammonia has been present to a slight extent at all the testing stations except Beckton, but always far below the maximum allowed. We would respectfully recommend these figures to the attention of Sir George Campbell.

Water and Sanitary Notes.

Mr. Morrison's motion with reference to the London Water Supply, which was to have been brought forward at the meeting of the Court of Common Council last Thursday, but which was lost sight of amid other exciting topics, is now upon the agenda for next Thursday week. The proposition is that "engineers and others" be invited to send in plans for supplying the Metropolis with water, presumably on some better system than that which now exists. A plan or a "mode" will do, and premiums are to be given by way of encouragement. Such, at least, is the proposal, if the Common Council see fit to adopt it. We should hardly think that the Corporation will care to take such a step. The City is not the Metropolis, and within the civic boundaries the arrangements with regard to the water supply might serve as a model for the rest of London. Certainly the Corporation have taken the lead in making the best use of the supply placed at their disposal, and if the authorities elsewhere would do the same, there would be no need to invoke any further engineering help. As for plans and "modes," there are plenty of them already. If the Corporation choose to amuse themselves with giving away money for fresh schemes, we presume they have the right to do so, but we cannot suppose that the Metropolis will be any the better for it.

The Vestry delegates are understood to be putting on their armour anew for the fight in respect to the Water Supply of the Metropolis. It has been announced that they are "summoned for an early date," to consider what they shall do. It is reported that they are going to "prepare representations "to the Home Secretary," confident that the Home Secretary will be prepared to receive them. Possibly Sir William Harcourt may care less for the delegates twaddle now than formerly. The scheme of Sir Richard Cross is quashed, and that is enough, though the Vestry delegates may be slow to perceive it. All the troublesome and intricate questions about the water supply are to be handed over for the consideration of the forthcoming Trust, and the Home Secretary no longer wants anybody to tell him what he had better do. No doubt, the delegates will meet and talk, and will fancy they are shaking the spheres. But the question has slipped

out of their fingers for the present; and perhaps the Vestries will find it necessary before long to take steps to secure their own existence.

The public are reminded that if ever the New River Company have to give place to a Water Trust or other immaculate institution, the Company will still live and prosper. This corporate body is really a land and water Company, and if the water be taken away, the land will remain. There are whole streets and squares on the New River estate, leases are falling in, and the property is rising in value. The land not yet built upon is also going up in the market, and the prospect altogether is understood to be highly encouraging. If the water rights are transferred, of course the Directors will give their undivided attention to the subject of houses and lands, and will do their utmost to make them productive. For the present they have two strings to their bow, and can await the coming session with philosophic calm.

The Derby Water-Works Company have held their final meeting. True to their instincts, the Corporation have dealt ungraciously with the Company in their manner of carrying out the agreement for the purchase. A Water Company is expected to show a spirit of self-abnegation and liberality; but a Town Council is exempt from any such obligation, and may demand the pound of flesh on the plea that it is for the good of the ratepayers, whereas if the Directors of a Water Company ever propose anything for the good of the Shareholders, it is looked upon as public robbery. The Chairman of the Derby Company, in his parting address to his constituents, referred incidentally to the rather curious visitation which has just befallen the Corporation. "A Nemesis had overtaken "them," in the shape of "some demented bellman," who went round the town denouncing the water supplied to the inhabitants. Had the supply been still in the hands of the Company, the bellman might have roared himself hoarse in decrying the quality of the water, and the Corporation would rather have applauded his zeal than otherwise. But a change had taken place which the bellman failed to appreciate. Influenced, perhaps, by his early education, he declared the water unfit to drink, but awoke to find he was behind the age. The water now belonged to the Corporation, and was consequently very good indeed. The Borough Analyst was referred to, and he declared that the water was absolutely free from all suspicion of impurity. The Corporation were ready to hang the bellman—that is to say, they suspended him, and we have not yet learned the issue. So it comes to pass that the Derby Water-Works Company walk off the scene with a clean bill of health in their hands, signed by the Corporation's scientific chemist.

The Manchester City Council have not yet come to the end of the case concerning Mr. Berrey and the late irregularities in respect to the water-works accounts. At the meeting of the Council, last week, the Water-Works Committee presented a report recommending that Mr. Berrey's duties should henceforth be limited to the superintendence and management of the indoor department, and that his salary be reduced from £1000 to £800 per annum. This reduction might be supposed to correspond to the reduction of his duties, the outdoor superintendence being otherwise provided for, as was originally the case. Mr. Berrey seems to have had too much to do, and the whole department has apparently been loosely conducted. Some amount of personal feeling shows itself in the investigation of this affair, and the report of the Committee—not the first that has appeared on the subject—was discussed with much animation at the recent meeting. After a prolonged debate, the report was referred back to the Committee for further consideration, on the ground that it was not sufficiently explicit. The votes on the subject were nearly equal, a strong minority being in favour of the adoption of the report.

The Ninth Annual Report of the Local Government Board has just made its appearance. It is a bulky volume, and we shall proceed to discuss its highly varied contents next week. In the meantime it may be of interest to state that the Urban Sanitary Authorities have in the course of the past year added more than twenty per cent. to the amount of their loans, the total sum being now considerably above fifty-six millions, or seven millions more than the aggregate value of the districts. The report contains the observation that, so far as this debt has been incurred in connection with reproductive works, "and especially in respect of gas and water "undertakings, it constitutes an apparent rather than a real "increase in the burdens imposed on the ratepayers." But it is added that this depends on the assumption that the works do not cost an excessive sum, and that the financial arrangements are of a judicious nature.

The "Amendment of the Sanitary Laws with reference to "Buildings" was the subject of a long and animated discussion at the Social Science Congress held last week in Edinburgh. The architects were emphatically denounced by Dr. Alexander Wood, who gave some frightful examples of their misdoings, and proposed that they should be "punished" for constructing houses which were afterwards found to be fatally defective in respect to the drainage. Dr. Wood declared, of his own personal knowledge, that "some of the "most infamously constructed houses in the country were "constructed by architects who had passed all the necessary "examinations." The "fixing of responsibility" in this, as in some other matters, is rendered difficult by the fact that the responsibility would have to be fixed in high and respectable quarters. There is no saying who might be sent to prison.

"Sanitary protection" is invoked with reference to dwelling-houses. It is alleged that most of the houses in the new part of Edinburgh are free from sewer gas, owing to the sanitary supervision exercised by the voluntary association formed in that city. The members of this society can have their drains inspected by a competent officer, who advises as to the proper measures to be adopted. But, according to the statement of "A Physician," there is another agency at work in Edinburgh, in the shape of the Burgh Engineer, whose services are at the call of every ratepayer as occasion may arise, and who makes, either personally or by some competent representative, an examination of all premises alleged to be in an unsanitary state. The defects, if any, are notified to the landlord, and if that person fails to make them good, the Burgh Engineer has the work done, charging the landlord with the expense. Theoretically we believe there is a similar power resting with the London Vestries, but it is only carried out with reference to the poorest class of houses, and even there by no means generally. House inspection is now demanded for the higher class of property, which is sometimes sorely in need of it.

Sewer ventilation still undergoes discussion. One gentleman suggests that the Local Government Board should refuse their sanction to any plan for the drainage of a town which does not provide properly for the ventilation of the sewers. The advice is good, providing the Local Government Board themselves know how the ventilation is to be effected. Another gentleman contends that sewers might be safely ventilated by means of gratings in the roadways, if the sewers were properly constructed so as not to retain any deposit. If the sewers are not properly laid down and duly flushed, we are warned that not even the best system of ventilation can put matters right. Another disputant views with alarm the prospect of ventilating-pipes from the house drains being carried up to the top of every building, and warns the inhabitants of the Metropolis as to the risk of being suffocated by "filthy fogs," when to the smoke of a million chimneys there shall be added the stench of a hundred thousand drains, for he assures us that when the smoke comes down from the chimneys, so also will the sewer gas descend from the housetops. He proposes, therefore, that the gas should be deodorized.

The health of the Parisians is about to be cared for after a fashion which, however desirable it may be in London as well as in Paris, would scarcely be tolerated anywhere on this side the Channel. The authorities of the French capital—so it is reported—moved by sanitary considerations, are about to put in force certain old laws with reference to the keeping of domestic animals. An inspection is shortly to be made involving a species of census of cats, dogs, birds, and other domestic pets, and regulations are to be enforced as to the number of these animals which each house is to be allowed to keep. For the sake of peace and quietness we might be glad of some such system in London; but we have only gone so far as to put a tax on dogs, though a like impost on cats has been frequently advocated. We half suspect that this professed regard for the health of the people dwelling in Paris is an ingenious excuse for killing the cats. Perhaps it is also designed to divert the inhabitants from a more serious apprehension of certain defects in the matter of drainage. A foray on domestic pets is a curious sequel to the recent outcry about unsanitary odours in the French capital. After all, it is easier to go to war with cats and dogs than with germs. As Dr. Letheby might say if he were living, the former can be seen, while the latter cannot.

Reduction in the Price of Gas at Plymouth.—The Plymouth and Stonehouse Gas Company have announced a reduction in the price of gas to 2s. 1d. per 1000 cubic feet, to date from Michaelmas last.

THE GLASGOW EXHIBITION OF ARTIFICIAL LIGHTING APPARATUS.

SECOND NOTICE.

Messrs. Edmundson and Co., of London and Dublin, principally conspicuous as the manufacturers of the Wigham lighthouse burners in use in various parts of the hall and grounds, occupy besides a stand whereon various applications of the albo-carbon lamps are shown. These tolerably well-known articles are the only examples contained in the exhibition of means whereby the illuminating power of gas can be increased by what may be called chemical action as distinguished from the physical effects produced by burners. There are two stands (bearing the names of Mr. Love, of Johnstone, and Messrs. J. and W. Weems, also of Johnstone, near Glasgow), at opposite ends of the hall, at which dazzling reflectors and polished balls mirror bright gas-jets in a manner which, although somewhat "circus"-like and hollow from a scientific standpoint, attracts much public admiration. Messrs. Faraday and Son, of London, show a single ventilating gas pendant of good construction, and nothing more. It is, in fact, noticeable that the ornamental parts of gas-fittings—the chandeliers, brackets, and standards—which the gas-consuming public have perhaps more frequently before them than any other outward and visible sign of gas as a lighting medium, are not at all so conspicuous as they should be in this exhibition. There are, of course, many scattered specimens of these appliances at the stands of different exhibitors of burners, &c., and there is one large stand of figure-lamps and elegant goods of the same class belonging to Messrs. J. Finlay and Co., of Glasgow, as agents for Messrs. Zimmermann and Co., of London; but beyond these there is no show such as two or three brassfounders and metal-workers of eminence in this line could have contributed, had they been so disposed.

Street-lamp standards are shown by Mr. D. M. Nelson, of Glasgow as manufactured by Messrs. W. and T. Allen and Co., of London; and devices for lighting gas by electricity, suitable for large halls, &c., are exhibited by the Messrs. Lennox, Lange, and Co., of Glasgow, Messrs. D. and G. Graham, of Glasgow, and the Science and Art Department, South Kensington. Messrs. Carnaby, of Glasgow and London, are also present with their useful and well-known apparatus for regulating, by the main cock on the consumer's meter, the admission of gas to any required consumption.

Turning now to the various stands whereon gas-stoves for cooking and heating are shown, we shall find a sufficient variety of these appliances to thoroughly exemplify the use of gas in both departments of utility wherein heat rather than light is required. First in order comes the very pretty metallo-ceramic tile bath, heated by gas, shown by Messrs. Kean and Wardrop, of Glasgow, which is most invitingly fitted up, and is apparently heated without difficulty. Then comes a simple circulating boiler, by Messrs. Wallace and Martin, of Glasgow; and next is to be found the somewhat important stand of Messrs. Ewart, of London, who show several baths and water heaters of the "instantaneous" description, wherein the water is turned on cold at the top and runs off hot at the bottom of the heating apparatus. Messrs. Boyd and Sons, of Paisley, show some examples of the usual kind of greenhouse or corridor warming coil-pipes heated by gas, and lead us up to the stand of Messrs. W. Harvie and Co., of Glasgow, who show several examples of Dr. Adams's new patent heating stoves, and one of the same inventor's new cooking stoves, now first exhibited. The construction of these stoves has already been explained in the JOURNAL [See Vol. XXXV., p. 634]; but it may be mentioned here that the stoves attract much attention from their novel shape and principle. The burner by which the heat is developed is decidedly new and ingenious, and the courses of the heated currents of air are cleverly contrived. Dr. Adams proposes to do the entire work of his cooking stove by the heat of one gas-burner, just as a coal-stove works with only one fire; and there can be no doubt that he succeeds in getting, from his special burner, a well-divided heat suitable for carrying on several operations at once. Whether or not this end is really worth an effort to attain is another matter, and one which can only be settled by experience, and by strictly comparing the new stove with others, weight for weight. Gas-stove makers who follow, with but small deviation, the well-known lines on which gas-stoves of ordinary construction are built, contend that the apportionment of separate burners to the independent works of roasting, baking, or boiling, which is a common feature of most gas-stoves, is their chief recommendation; and that the fact of an ordinary coal-fire range requiring its full power to be exerted to enable it to do anything at all, is one of the principal reasons why the multiple-fired gas-stove, burning a more costly fuel, can compete with it on equal terms. Dr. Adams has been very successful with his heating stoves; whether he will be equally so with his cooker remains to be proved. As we have already said, it is well designed and carefully thought out; it must now be shown that it will cook as well and as conveniently as any other stove, and with less consumption of gas.

The heating stoves, of which there are several kinds shown, differ perhaps more widely in design than do the various cookers. Messrs. John Wigglesworth and Son, of Nottingham, show several examples of Gillingham's patent heat radiator, which is an apparatus constructed on the same principle as Mr. Vernon Harcourt's arrangement for warming a small greenhouse, described by him at the last meeting of the British Association of Gas Managers. Gillingham's apparatus is therefore a true radiator, composed of a horizontal cylinder of sheet metal supported at each end by a smaller vertical pipe. In the centre of the cylinder another vertical pipe descends to a gas-burner, and takes up the hot products of combustion, which give out their heat in the cylinder, and finally escape downwards by the end pipes. The whole arrangement is as simple as can well be devised, and must be effective to the extent of its range, which is not unlimited. Another very useful and decidedly original gas heater is the Argand arrangement of Messrs. Ritchie and Co., of London, which is oddly like a magnified pressure-gauge with central tube; the centre being the burner, and the side pipes giving out warmed air. Messrs. Farwig and Co., of London, have also a stand for showing George's gas calorigen—another stove for heating air. There are other air-heating stoves exhibited by Messrs. Shaw, of Glasgow, Messrs. Stark and Co., of Torquay, and others. But we cannot award unqualified praise to the principle of these hot-air stoves. A good radiating gas-stove is wanted, if gas is to really take the place of coal in living-rooms, and there are not wanting attempts to supply this *desideratum*. Mr. C. Wilson, of Leeds, is well forward in this respect with a handy little stove for fixing in the place of an ordinary fire-grate, or hanging in front of it, in which an atmospheric burner heats a vertical fire-block covered with wire netting, and this in turn radiates heat into the room, while the products of combustion go up the chimney. The principle is also applied in a separate form, independent of a chimney or grate. It is needless to say that the so-called "Cheerful" stoves, which reflect the radiant heat from a line of gas-jets, and the variously modified gas fires—lumps of fire-clay and pieces of asbestos arranged in feeble imitation of a coal or wood fire, and heated by more or less cunningly concealed gas-jets—are both shown at several stands. These objects are not strange, and call for no special mention.

Gas cookers are in great force. Mr. C. Wilson, of Leeds, shows a number of the efficient close stoves for which he is celebrated—strongly made, not particularly ornamental perhaps, but still adapted in all respects to family use. It should be remembered Mr. Wilson's oven and roaster is in one, and heated by atmospheric burners in the bottom. This arrangement permits of a large joint being cooked when required—at the sacrifice, of course, of the upper shelf space otherwise available for pies, &c. Messrs. Beverley and Wylde, of Leeds, show several large stoves of very good construction. Their oven is also heated from beneath by an enclosed atmospheric burner, and in some examples is lined with white tiles. The stoves of these two makers may be taken as the type of many others—the enclosed burner, large oven, &c. In one stove, Messrs. Beverley and Wylde make the rest for kettles or pans, over the boiling stoves on the top, of a pipe bent into several returns, which being connected with a water cistern, forms a circulating arrangement for heating water. The use of atmospheric burners for giving the radiant heat needed for roasting is not to be commended on theoretical grounds, as we know that ordinary gas-jets give more radiant heat than Bunsen burners. The reason sometimes offered, that the openings of the atmospheric burners are larger, and not so easily choked as those of a common jet, although fairly sensible, does not explain the persistent use of inferior means to attain the required end. The best means of producing heat should be adopted, and any risk of accidental fouling should be guarded against by proper means. Messrs. Stark and Co., of Torquay, whose energy in sending their goods such a long distance deserves a reward, show articles on quite a different principle. Their stoves are heated from without, by ordinary burners applied to a kind of channel which delivers hot air into the oven. Ovens thus heated naturally require a somewhat longer time to get ready for cooking, but when fairly started they are easily kept hot. The fact that all the gas required for heating is burnt outside the oven, is probably a good point in Messrs. Stark and Co.'s favour with fastidious customers. Messrs. Billing and Co., of London, represent another principle of gas roasting in their examples of "reflector" cookers, which are distinguished by all the roasting being done by reflected heat from ordinary gas-jets situated above the meat, the roasting compartment being freely exposed to air in natural circulation. The same gas-jets heat the close oven, which is quite distinct from the roaster. Messrs. Billing and Co.'s manufactures are very neat and well finished, and attract much notice. The "Retort" cookers, which come to us from across the Atlantic, are shown by Messrs. P. and R. Fleming and Co., of Glasgow, and although well constructed, are not, perhaps, calculated to revolutionize the gas-stove trade. Messrs. J. Finlay and Co., of Glasgow, show specimens of stoves manufactured by Messrs. S. Leoni and Co., of London; and Messrs. A. Shaw and Son, of Glasgow, have some stoves of Messrs. Wright and Co.'s, of Birmingham, neither firm of makers having special stands of their own. The Argyle Ironmongery Company, of Glasgow, show a variety of well-made stoves, two of them being of considerable dimensions, and fitted for coal and gas in combination. Messrs. Chalmers and Son, of Glasgow, show a number of stoves made by Messrs. Siddaway and Co., of West Bromwich, which are low-priced and serviceable. It may be said with so many varieties of gas-cookers on view, that if an intending purchaser should by any chance leave the hall unsuited, it will be due rather to his own vacillation between many suitable patterns, than to any lack of satisfactory goods.

Mr. Fletcher, of Warrington, contributes a series of first-class burners for laboratory use, including examples of portable gas furnaces for crucibles, muffles, ladles, and other purposes, and also various kinds of blowpipes. Mr. Fletcher's exhibit is a complete demonstration of the manifold utility of gas in the laboratory of the chemist or metallurgist. Messrs. Verity Bros., of London, show various applications of their fire-clay burners for cooking, boiling, &c., and also some apparatus for ventilating sewers or buildings in connection with the use of gas-lamps, which appears to act remarkably well.

Among the more miscellaneous appliances for utilizing the heat of gas may be noticed the somewhat curious arrangement for heating laundry irons with a blast, shown by the queerly-named Air Burning Company, of Glasgow; and the different arrangement, with the same

object, of Messrs. F. Rath and Co., of London. Both manufacturers aim at keeping the irons constantly hot while in use, by gas-flames continually burning within them. The Sanitary and Domestic Appliances Company, of Manchester, exhibit a multitude of ingeniously-made articles, such as gas fire-lighters, gas-heated irons for laundry work and for silk hats, gas-lighting torches, &c.; and Mr. W. H. Hilton, of London, has a number of goods of a similar description, and remarkably low in price.

In the department of gas motor machinery there is not much real competition. The Otto gas-engines, of which there are two, of 8 and 4 horse power respectively, manufactured by Messrs. Crossley Bros., of Manchester, have it all their own way as to examples of powerful machines. The larger is intended to drive the magneto-electric machines for ten electric lamps supplied by Messrs. Strode and Co., of London, a firm here principally represented by electric lighting apparatus, but more generally known as gas-fittings manufacturers; and the smaller actuates another dynamo machine employed by Messrs. Thomas Smith and Son, of Glasgow, in the work of electro-plating, shown by them in operation. The "Bisschop" vertical gas-engine is shown by Mr. J. Brownlee, of Glasgow, as manufactured by Mr. Andrew, of Stockport, in sizes up to ½-horse power. Messrs. Thompson, Sterne, and Co., of Glasgow, also have a stand for showing a Clerk's gas-engine, and one of Ericsson's new hot-air pumping-engines, worked by gas. This novel engine, the first of its kind exhibited in this country, is an American production of most ingenious construction, as might be inferred from the name of its illustrious inventor. It is remarkable, among other reasons, for using the same air over and over again, expanded by heat, and subsequently cooled by a water jacket; but its details would require more space for explanation than can be spared here. It may be remarked that the extraordinary petroleum engine, shown by this firm at the Royal Agricultural Society's Kilburn Exhibition last year, does not make a re-appearance at Glasgow. Altogether it may be said that the reputation of gas as a motive power is well maintained at Glasgow, though with few examples. We must not omit to notice that Wigham's fog-horn, sounded by gas power, is very conspicuous in the exhibition, or rather in the neighbourhood, which resounds at intervals with its penetrating, if rather unpleasant tones. The inhabitants of the vicinity of the Great Western Road will probably long retain memories of its remarkable powers.

Several exhibits of the products derived from gas tar and ammoniacal liquor, of a thoroughly representative character, distinguish this exhibition most appropriately, considering the locality, Glasgow being world-famed for its chemical manufactures. Of these the splendid case belonging to Messrs. Burt, Boulton, and Haywood, of London, is most conspicuous. Commencing with the unpromising-looking raw materials, this case contains the first series of the products of the distillation of tar, consisting of crude naphtha, creosote, naphthaline, anthracene oil, and hard and soft pitch; then we have the benzol and toluol series of products from the crude naphtha, prepared for the manufacture of the aniline colours. Carbolic acid, nitro-phenol, and cresylic acid form a distinct group; and naphthaline in various forms is also shown, some of the pure material being in crystals two inches long. Anthracene is also exhibited, the beautiful fluorescence of the pure article, crystal and liquid, being very remarkable, the latter being in the form of dichloranthracene-disulphonic acid. Messrs. Burt and Co. carry out the manufacture of alizarine, or the material which has supplanted madder as a dye, more completely than any other product, and specimens of "Turkey-red" dyed with their alizarines are calculated to give, in the contemplation, more pleasure to gas-tar manufacturers than to the proprietors of madder farms, or the importers of that material. The German manufacturers of aniline dyes are represented by Mr. J. A. Dixon, of Glasgow, in a neat exhibit including a sample of the artificial indigo recently discovered, after years of experimental research, by Professor Adolf Baëyer, of Munich, which is in all probability destined to give a death-blow to the indigo cultivation of India. With a notice of the stand of coal tar and ammoniacal liquor products manufactured by the West of Scotland Chemical Company, of Maryhill, shown by Messrs. Archibald Arrol and Sons, of Glasgow, which look particularly clean and good, our notice of the exhibits of gas and its derivatives and accompaniments at Glasgow must close.

We may add that the ventilation of the hall, alluded to in our first notice of the exhibition, has since been made perfect.

Notes.

[*This column is intended to contain miscellaneous memoranda on topics of general professional interest to our readers. We shall be glad to receive for insertion in it any scraps of information, observations of facts, or descriptions of apparatus, &c., which may be worth publication, and yet may not be considered suitable for our "Correspondence" column.*]

Half a Century's Progress in the Gas Supply of London.

In the "Repertory of Arts," &c., for the year 1832, some interesting statistics are given respecting the gas supply of London at that period. It is stated that the gas by which the Metropolis was then illuminated was produced by the consumption of something like 38,000 chaldrons, or 48,450 tons of coal per annum. The gas produced from this bulk of raw material was used in the supply of 62,000 gas-burners in shops, private houses, &c., and 7500 street-lamps. Two years previously—namely, in 1830—there was in the soil a total length of mains of over 1000 miles. The same authority states that "gas lights of half an inch in diameter supply a light equal to 20 candles; of 1 inch in diameter, a light equal to 100 candles; 2 inches, 420 candles; 3 inches, 1000 candles." It is to be regretted that the writer in the "Repertory" did not give some particulars as to the amount of capital employed in furnishing the metropolitan gas supply at the period alluded to, and of the dividends paid upon it, as these would have afforded scope for some interesting comparisons to be made in reference to the present position of the gas industry in London. Two of his items may, however, be taken for this purpose—the number of tons of coal carbonized, and the number of public lamps supplied—and when they are placed side by side with similar items furnished by the last accounts presented to Parliament by the Metropolis Gas Companies, the difference in the figures is somewhat startling. According to these accounts, about 1,870,000 tons of coal were consumed for gas-making purposes in the course of the year 1879, and of the gas made from this bulk of raw material, rather over 16,533 million cubic feet were supplied to private consumers, and about 1104 millions by contract and to the public lamps, of which there were 60,800 in use on the last day of that year. Taking the usual consumption of a private light, the first-mentioned total would show that there were over 4 million gas-burners in use in the houses of the Metropolis nine months since, and of course the number is now larger. The total capital employed in furnishing gaslight in London was, on Dec. 31 last, close upon £12,700,000, which last year earned a profit of £1,163,077, being at the rate of about 9 per cent. on the capital employed, and 38 per cent. upon the gas-rental. With regard to the length of mains, it is sufficient to say that those laid in the district of one of the Metropolitan Companies alone exceed by 50 per cent. the entire length of piping beneath the streets of London at the time the note in the "Repertory" was penned. Such, very briefly stated, is the progress made by the gas industry in the Metropolis in the course of the past half century.

The Subsoil of Paris.

According to a communication made by M. Henri Sainte-Claire Deville to the French Academy of Sciences, the subsoil of Paris possesses a curious composition. The quantity of water impregnating 2·530 kilos. of soil, or mud, may be estimated at half a litre, holding about 25 to 30 grammes of salts in solution, the liquid being therefore highly charged; the cause whereof is thus explained:—The subsoil of Paris not being drained, the paving-stoves and spaces between them become impermeable as soon as their surface is wetted. When these spaces become dry the subsoil water evaporates, and thus gets concentrated, until the rain water and the watering-carts wash down all kinds of soluble and organic matter, and soaking into the spaces between the paving-stoves, render the surface impermeable afresh. The water contained in the underlying black mud is thus continually being saturated. Again, it receives the particles of iron worn away from the shoes of horses and the tires of carriage-wheels, considered by M. Chevreul to be the cause of the iron compounds found in the soil, and of the black coloration of the mud itself. Moreover, the escapes of gas from the street-mains, estimated at about one-tenth of the total quantity of gas in circulation through them, have added quantities of sulphur, hydrocarbons, and tar, which are abundantly found in the soil of Paris. The action of this tar is described as beneficial, for, in consequence of the antiseptic qualities of the phenic acid which it contains, all fermentative action in the other ingredients of the black mud below the streets of Paris is supposed to be prevented. The odour arising from the mud is therefore but slightly contaminated with sulphuretted hydrogen, not more objectionable than the atmosphere pervading many mineral water springs—which, however, is not saying much in its favour as a perfume—and is also slightly empyreumatic, a smell as healthy in its effects as the emanations from the various gas-works in the environs of Paris, to which patients suffering from certain epidemic affections, notably whooping-cough, are sent for relief. Therefore, according to M. Deville, the Paris Gas Company, among other things, materially contribute towards the sanitation of the city.

The Expansion and Compressibility of Gases.

There were published in a recent number of the *Comptes Rendus*, the results of recent researches by M. Amagat on the expansion and compressibility of gases under strong pressures, the following laws being deduced:—1. The coefficient of dilatation of gases increases with the pressure to a maximum, then decreases indefinitely. 2. The maximum occurs under the pressure with which the product $p\,v$ is minimum, where the gas accidentally follows Mariotte's law. 3. It diminishes with higher temperatures, and finally disappears. 4. At a sufficiently high temperature the compressibility of fluids is represented by the formula $p\,(v - a) = \text{const.}$; a being the smallest volume the mass of fluid can occupy. This is the limiting law. For each gas a has a special value. 5. For pressures below the critical point, the deviation from Mariotte's law, first positive for a temperature sufficiently low, becomes *nil*; then negative, with increasing temperature; but beyond a certain negative value it diminishes indefinitely without changing sign. 6. For pressures between the critical pressures and a superior limit, special for each gas, the period during which the deviation is positive is preceded at a lower temperature by a period in which it is negative; so that the deviation twice changes sign. 7. Beyond the upper limit of pressure indicated in the preceding law the deviation is always negative, whatever the temperature. It diminishes, in general, when the temperature increases, except for pressures near the limit, where its variation is more complex.

Phosphorescent Lighting.—Dr. Phipson, says *Les Mondes*, takes sulphide of barium, or some other substance which is rendered phosphorescent by the solar rays, and encloses it in a Geissler tube, through which he passes a constant electric current of a feeble but regular intensity. He claims to obtain in this manner a uniform and agreeable light, at a cost lower than that of gas.

Communicated Article.

IS A HIGH YIELD OF GAS PER TON OF COAL CARBONIZED AN INFALLIBLE TEST OF GOOD MANAGEMENT?

By Mr. GEORGE LIVESEY,
Secretary and Engineer of the South Metropolitan Gas Company.

The interesting articles by Mr. H. Leicester Greville, on the amount of light naphtha in coal tar and its illuminative value, which were recently published in the JOURNAL, invite attention to a question of some importance to gas managers and to gas companies and corporations owning gas-works. It seems to be assumed that a high make of gas per ton of coal is indisputable evidence of good working, reflecting credit on the manager, and bringing profit to the undertaking. It is, therefore, one of the usual things for the chairman at a meeting of shareholders to make a great flourish of trumpets over a make of, say, 10,500 feet of gas per ton of Newcastle coal carbonized; but he never tells his audience the cost at which this result has been attained—probably supposing, and certainly leading his hearers to suppose, that the increased yield has been obtained without any increase of cost whatever.

If the increased yield is brought about by the prevention of leakage from the retorts, or the removal of the dip, or the prevention of oscillation and the working with a steady level gauge, or by improvements in charging, or more regular heats, while all other conditions remain unchanged, the additional make per ton—provided the illuminating power be not reduced—is a clear gain. Supposing, however, that the additional make is the result of harder firing—which is usually the main element in producing an enlarged volume of gas—then it is not a clear gain by any means.

It is well known that when the economical maximum is attained, the cost of going beyond that point increases in a very rapid ratio until the gain, however great, is more than counterbalanced by the cost of obtaining it. This is strikingly illustrated in the speed of steamships, and the same principle must apply to gas-making.

If an extra 500 feet of gas per ton of coal carbonized is obtained by higher heats, experience shows that the quantity is increased at the expense of the quality. It appears from Mr. Greville's investigations that the quantity of light naphtha found in the tar is very nearly sufficient—if entirely absorbed by the gas—to add one candle to the illuminating power, or to prevent its reduction to that extent. As this, however, does not appear to be the case, it is probable that high heats have but little effect in transferring the light naphthas from the tar to the gas. If they were transferred, a valuable constituent would be taken from the tar, thus reducing its value, and causing a loss on the tar approaching, if not quite equal to the gain on the gas. "You cannot eat your cake and have it."

Seeing that an extra 500 feet per ton is an item that stands out clearly, whilst the items on the other side are to a great extent wrapt in obscurity, and of unknown value, it is not surprising that the one should have been brought prominently forward and the others overlooked or forgotten.

It is very desirable that some attempt should be made to ascertain the economical maximum make of gas per ton, and to this end the following *pros* and *cons* may be suggestive, and lead to the necessary experiments that should be undertaken to clear up the doubtful points. It is quite open to any one to set his value on the various items in the annexed statement:—

Statement based on the Comparison of 9800 *Feet of* 15½*-Candle Gas against* 10,300 *Feet per Ton of Newcastle Coal in London.*

Estimated reduction of illuminating power at least half a candle, requiring 3½ per cent. of cannel, producing 30-candle gas, to make up the deficiency of light, the extra cost of the cannel and the diminished value of its coke will add from 10d. to 1s. per ton to the cost of coal, say	0s. 10d.
Extra fuel estimated at least 10 per cent.	0 2
Less tar produced, estimated 1 gallon	0 2
Increased wear and tear of retorts and trouble with stopped pipes, say	0 1
	1s. 3d.
Deduct—	
An increase of 5 per cent. in the make per ton is equivalent to a saving of 5 per cent. of carbonizing labour, which, according to Mr. Field, is rather less than	2d.
5 per cent. less of retort-houses and retorts for the same amount of work effects a saving of plant, which at 10 per cent. interest amounts to	1d.
	0s. 3d.
Difference	1s. 0d.

If this is correct, it appears that the net cost of producing an extra 500 feet of crude gas is 1s., the said gas being not worth more than 6d. in the retort-house.

Can this be even approximately correct? If so, these vaunted high makes per ton, where cannel has to be used to keep up the quality, are a great mistake, and even where the reduction of quality is of no consequence, and cannel is not required, the 6d. worth of gas is not by any means obtained for nothing.

The object of the writer for many years has been to produce, with the smallest amount of cannel, gas of the required quality of 16 candles, being content with a make of 9800 feet per ton. Experiments are about to be made for the purpose of ascertaining the point at which it ceases to be economical to increase the make per ton; and it may be found better to produce only 9500 feet or so without cannel, than any larger quantity with the addition of that expensive article. The result of those experiments shall be placed at your service, and if others will give to your readers the benefit of their experience on this important question, even if it goes to prove that the writer is altogether mistaken, no one will be more pleased than he to see a satisfactory conclusion take the place of the present uncertainty.

Correspondence.

[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

THE DISTILLATION OF COAL TAR.

SIR,—I have read with some degree of interest, in the JOURNAL of the 5th inst., the specification of Mr. G. C. Trewby and Mr. H. W. Fenner for improvements in the mode of distilling tar by steam and perforated internal pipes. I must say I was rather astonished to see, at this date, that they had been at the trouble and expense of patenting a process for heating, boiling, or distilling coal tar, which was known and adopted by my father, who was a tar distiller, many years ago.

It may not be out of place for me to state on my own account that for a certainty I assisted, under my father's directions, in erecting a tar still—not a circular one as illustrated in fig. 2 in the specification, as it was a longitudinal boiler, but shaped the same in the bottom as represented in fig. 1, and the only other perceptible difference I can see is in the outlet, the dome or stand-pipe of which stood 3, 4, or perhaps 5 feet high, as near as I can remember, on the boiler, erected upwards of 30 years ago, and which I now refer to.

A. FORD.

Oct. 6, 1880.

THE GLASGOW EXHIBITION OF ARTIFICIAL LIGHTING APPARATUS.

SIR,—In your notice of the above-named exhibition, commenting on the goods exhibited by Mr. Sugg, you observe that a Methven's gas-testing apparatus was amongst his collection. I cannot, however, but regret that one of my illuminating power standards, as manufactured by the authorized makers, Messrs. A. Wright and Co.—the construction of which I thoroughly approve of, and the accuracy of which I am prepared to certify—was not exhibited instead of an instrument which has not received my approval, and of the accuracy of which I know nothing. The simple construction of the standard made by the firm named above will, I feel certain, commend itself to our gas friends in the North, as it embraces all that is necessary to make the instrument an accurate and unvarying standard.

I am indebted to Mr. Greville Williams, F.R.S.—who has arranged to deliver a lecture in Glasgow next week—for his kindness in undertaking to show the instrument with which, during the last six months, he has made several hundred delicate determinations of the illuminating power of various gases; and those who will have the pleasure of hearing the lecture will have the opportunity of inspecting the apparatus.

JOHN METHVEN.

London Gas-Works, Nine Elms, S.W., Oct. 9, 1880.

Legal Intelligence.

SALFORD HUNDRED QUARTER SESSIONS.—WEDNESDAY, OCT. 6.

(Before Mr. W. H. HIGGIN, Q.C., *Chairman; Mr.* CHRISTIE, *and Mr.* J. A. RUSSELL, Q.C.)

THE STRETFORD GAS COMPANY AND THEIR ACCOUNTS.

At the April sittings of the Court, an application was made on behalf of Dr. C. A. Burghardt and Mr. A. Sussum, as representatives of the Stretford Gas Consumers Vigilance Association, praying for the appointment by the Court of an Auditor to examine the accounts of the Stretford Gas Company, with a view to obtain, after the Auditor should have presented his report, an order for a reduction to be made in the price charged by the Company for gas. The Court granted the application, and Mr. W. Aldred, of Manchester, was chosen Auditor, and his appointment was approved by the Company. In due course Mr. Aldred submitted his report; but when the case came on for hearing at the July sittings of the Court (see *ante*, p. 100), the Chairman stated that he did not consider the report was sufficient. What the Court wanted was, he said, that a competent person should show, from the accounts of the Company, by separate balance-sheets for each year, what ought to be the price charged to the consumers for gas. It being then intimated, on behalf of the Company, that they were desirous of having the matter thoroughly inquired into, and had engaged Mr. Locock Webb, Q.C., to answer Mr. Aldred's statements, it was agreed to adjourn the proceedings till the October sittings. Accordingly, the case came on for hearing this day.

Mr. TAYLOR again appeared for the petitioners; Mr. LOCOCK WEBB, Q.C., and Mr. NASH represented the Company.

The CLERK of the PEACE (Mr. Hulton) read the petition, which was dated April 19, 1880, and stated that the Stretford Gas Company was incorporated in 1862, their nominal capital being £100,000. The share capital consisted of ordinary shares of the value of £25,000, which were authorized to receive a maximum dividend of 10 per cent.; new shares of the value of £14,000, authorized to receive a maximum dividend of 7½ per cent.; and 19,989 new "A" shares, entitled to receive a maximum dividend of 7 per cent. per annum. Large profits, the petition stated, had been distributed among the Shareholders of the Company in excess of the authorized dividends, and in violation of the provisions of the Gas-Works Clauses Acts. The petitioners had been unable to ascertain the amount distributed previous to 1871, but the total sum distributed between that time and 1878 was £7800. The result was that those using the gas of the Company had been greatly overcharged.

Mr. TAYLOR explained that, in accordance with the prayer of the petition, the Court in April last appointed Mr. W. Aldred, of Manchester, to inquire into the accounts of the Company. That gentleman having prepared a report, it was submitted to the Court on the 7th of July; but as the other side had not had time to investigate it, its presentation was deferred, and Mr. Aldred was instructed in the meantime to prepare a supplementary report, showing what the price of gas ought to have been during the years specified. He proposed that the report of Mr. Aldred should be received. It was an extremely voluminous one, and he thought it might be taken as read.

Mr. LOCOCK WEBB said he had no objection to the report being received, but he strongly objected to some portions of it, because he considered it went far beyond the proper province of the gentleman who was appointed to

inquire into the concerns of the Company. The only question which he believed had to be considered was the state of the Company in 1879.

Mr. TAYLOR maintained that the Court had power to go a long way back into the history of the Company in making its inquiry. He quoted the provisions of the Gas-Works Clauses Acts, 1847 and 1871, and sections of the Company's special Act, and laid particular emphasis on the 35th section of the Act of 1847, which gives to the Court of Quarter Sessions power to order an inquiry into the affairs of a gas company in order to ascertain whether the amount paid in dividends is greater than the shareholders are legally entitled to, and whether a reserve-fund has been formed equal in amount to that prescribed by the Act. He observed that the reserve-fund of the Stretford Gas Company should have been £10,000, or one-tenth of the nominal capital. Until recently, however, there was no reserve-fund. The consumers, therefore, had to pay more for their gas, because the interest arising from a reserve-fund would have been included among the profits, and therefore have reduced the price. Notwithstanding, however, the fact that the Company had not created a reserve-fund of £10,000, he should contend that they were not entitled to plead that fact as a reason why the price of gas had been kept up so high. The Company could not be allowed to set up their own fraud as an answer to the application of the petitioners. By neglecting to form a reserve-fund the Company were stopped from maintaining that the reserve-fund was not equal to what the Act of Parliament prescribed.

The CHAIRMAN remarked that if all Mr. Taylor was stating were true, then the case against the respondents would be so strong that the Court would not have power to deal with the matter, because the remedy at their disposal would not be sufficient.

Mr. TAYLOR said he should show from the accounts of the Company that they had received £22,000 of profits in excess of the dividends allowed, of which £1000 had been distributed in an ingenious form, by making the dividends free of income-tax. Having regard to the power of the Court, he respectfully submitted, in view of the large amount which the Shareholders of the Company had received, to which they were not legally entitled—an act which was a misdemeanour, and for which the Company were indictable—that the Court should make an order which would have the effect of recouping the consumers, and repaying them money which had been wrongly taken out of their pockets. If the Company were ordered by the Court to supply gas at 1d. per 1000 cubic feet, it would be nearly two years before the Shareholders would have recouped the money which they had fraudulently put into their pockets.

[A long argument arose between the Court and Mr. Taylor as to the power of the Court to make an order which would have the effect of compelling the Shareholders to refund moneys alleged to have been received, farther back than 1879, in excess of the dividend to which they were entitled. Mr. Russell, Q.C., pointed out that if the view expressed by Mr. Taylor were correct, the 35th section of the Act would be made a penal and not a remedial one. In that case he thought the Legislature would have more clearly expressed their intention to make the section penal. Ultimately the Court ruled that it did not possess power to go back beyond the preceding year, 1879, and pointed out that if the present consumers were recouped for what had been taken from consumers during several previous years, in many cases existing consumers would be recouped for what had been taken not from them, but from other consumers.]

The CHAIRMAN asked why the petitioners had not gone to the Clerk of the Peace, and finding that the accounts of the Company had not been filed, had not sued for the penalty of £20.

Mr. TAYLOR: If you will pardon me, I should say because we did not believe that we had rogues to deal with.

Mr. LOCOCK WEBB: Really you should not say that—you should not presume that.

Mr. TAYLOR: I am not presuming it. It appears on their own accounts.

Mr. *William Aldred*, the Accountant, was then called, and submitted his supplementary report.

Mr. TAYLOR said the report showed that in the year 1871 the then Shareholders of the Company each received a *pro ratâ* bonus equal to 10 per cent. in the form of fully paid-up shares. That bonus amounted to £3000. In 1874 the sum of £2000 was disposed of this way—the holders of 1000 shares, on which a first call of 60s. had been made, were credited with the payment of 40s. each, which never was paid. Then upon that £5000 of stock, dividends had been paid from time to time which amounted to £2850. This, of course, was illegal. Then in December, 1877, £7800 was distributed amongst the Shareholders. All the dividends, he understood, had been paid free of income-tax, which helped to make a sum of £17,109 6s., of which the consumers of gas in the Company's district had been defrauded.

Mr. *Aldred* then proceeded to give evidence to the effect that in the year 1862 the price of the gas supplied by the Company was 5s. 5d. per 1000 feet, which was subsequently reduced on several occasions, until in 1871 it was 3s. 9d. per 1000; in 1872 it was advanced, in consequence of the high price of coal, to 4s. 2d; in 1873 to 4s. 7d.; in 1875 it was reduced to 4s. 2d., in 1879 to 3s. 9d., and subsequently to 3s. 6d. per 1000 feet. The cost of the production of gas, including the payment of the dividends, had been slightly less than 3s. 6d. per 1000 feet from 1876 to 1879. He further stated that the Company had made an investment with the Manchester Corporation, which did not, however, appear to be connected with a reserve-fund, the total amount of their investments being £4146 17s. 6d. There was what might be called "bogus" capital to the extent of £17,000, which, of course, materially affected the price of the production of gas. £2342 had been realized as premiums on shares.

Mr. LOCOCK WEBB, in addressing the Court for the respondents, said his observations would be greatly shortened by the decision at which the Court had arrived, not to go farther back than the year 1879. His friend Mr. Taylor had thought fit to use some very strong language with regard to the Shareholders of the Company—gentlemen who stood among the chief inhabitants of Stretford, Sale, and the neighbourhood. He had chosen to call them rogues, swindlers, fraudulent dealers, and he (the learned counsel) knew not what besides; and had travelled back 20 years in order to find some possible excuse for using those terms. If he were at liberty to go into the whole facts, he would with confidence do so, as he could entirely disprove the allegations which had been made against the Company. He would not, however, answer those charges, except by calling attention to matters which he thought ought to be brought to the attention of the Court. With regard to what had been said concerning the neglect of the Company to file their accounts, if the ratepayers had been dissatisfied they could have taken the matter up years ago, and if the Company had done wrong, could have compelled them to pay the penalty. The fact, however, was that the consumers knew that they were being treated as well as they could reasonably expect to be, for the Company had supplied them with the highest quality of gas—22-candle—whereas they were only required to supply gas equal to 14 candles. The Acts of Parliament relating to the matters before the Court were very ambiguous, and he maintained that the Court had no jurisdiction farther back than 1877, when the Company's last Act of Parliament was obtained. Many of the acts on which the charges preferred against the Company were based were done a long time ago—before the passing of the Act of 1877. A considerable portion of the money standing to the credit of the Company previous to the passing of this Act had been included in the £17,000 to which reference had been made, and it was a question whether the Company had not a right to pay dividends free of income-tax in the manner they did. He maintained also that Mr. Taylor's contention with reference to a reserve-fund would not bear close examination, and that the amount received from premiums on shares ought not to be reckoned as profits out of which a reduction in the price of gas could be made. The wrongs complained of having been done many years ago, and done to persons other than the present consumers, why should the existing consumers have any benefit at the expense of the Shareholders, seeing that the money which was alleged to have been misappropriated did not accumulate in their time? He would be able to show also that the evidence of Mr. Aldred could not be safely acted upon, for he would call Mr. T. Newbigging, an Engineer of large experience, to show that the cost of the production of gas was greater than Mr. Aldred stated. He should also call Mr. Smith, an Accountant, who would tell the Court that Mr. Aldred's view of the accounts of the Company was subject to very great modification. The evidence to be tendered for the respondents would, he believed, convince the Court that there was no necessity whatever for making any order concerning the price of the gas supplied by the Company, and that the Directors might be safely left to pursue the straightforward policy which they had always followed—a policy which led them to reduce the price of gas as much as they possibly could, at the same time giving a supply of a much better quality than that required by their Act of Parliament.

THURSDAY, OCT. 7.

Mr. *D. Smith*, the Auditor of the Company, stated that the total sum received from the Shareholders down to Dec. 31, 1879, was £59,000. The sum expended by the Company up to that date, on works, mains, service-pipes, &c., was £55,703 18s. 5½d. This left a balance of unexpended capital of £3296, which was not too large, for it had all been spent in extending the works. If this balance of unexpended capital had not been in hand, a call would, he imagined, have had to be made to pay for the works now in progress. Since 1878, when the Company put by £3500, they had set aside £500 each year for depreciation. In December, 1877, the old depreciation-fund, amounting to £7800, was divided amongst the Shareholders, who had also received the bonuses mentioned in Mr. Aldred's report. Six hundred shares of £5 each were credited to them. The money thus distributed—£3000—was wanted for extensions of works, and if it had not been credited to the share capital a call would have had to be made upon the Shareholders for a like amount.

The CHAIRMAN: Why did the Directors, wanting cash to pay for works in progress, present that very cash to the Shareholders?

Witness: I cannot tell.

The CHAIRMAN: In May, 1871, you had £3000 of accumulated profits; why did you not carry that sum to a reserve-fund instead of presenting it to the Shareholders?

Witness: That I cannot answer.

The CHAIRMAN: Well, that is the very question which needs to be answered. The charge is this, that to the extent of £17,109, representing accumulated profits from 1871 down to the present time, the Shareholders have put money into their pockets which should have gone to the reserve-fund and secured a reduction in the price of gas.

Mr. NASH observed that the Company never had in their possession a sum of £10,000 which they could have placed to a reserve-fund. The most they ever had was £7789.

The CHAIRMAN: Well, ought not these amounts to have gone towards reducing the price of gas, according to your own showing?

Witness said he did not know. In answer to further questions, he stated that after filling up the reserve-fund and taking credit for having paid the maximum dividends, there should be in the hands of the Company the sum of £7789.

The CHAIRMAN: Is not that a complete case why there should be a reduction in the price of gas?

Mr. NASH: I do not know that. The accumulations cover many years past.

The CHAIRMAN said that the witness had apparently shown that there was a case made out for an order for a reduction in the price of gas. There was, however, a much more serious question behind the case, though Mr. Christie and Mr. Russell were not oppressed with the doubts that he (the Chairman) entertained. He had very serious doubts whether, upon the facts disclosed, the Court had any jurisdiction at all. If the case were such as Mr. Taylor had stated, there ought to be a remedy far beyond a mere reduction in the price of gas, because the proper remedy would be to extract from the pockets of the Shareholders that which they were alleged to have improperly taken from the consumers. One of the facts which should exist before the Court could exercise jurisdiction was not proved. The Gas-Works Clauses Act was evidently passed to make arrangements between honest companies and honest consumers. If the Court had power to order a reduction in the price of gas, he did not think it would have much difficulty in fixing the rate.

Mr. CHRISTIE observed that the point mentioned by the Chairman also troubled him, but it seemed to him that Mr. Taylor had put a reasonable construction on the Act. The object of the 35th section appeared to be to provide an authority for fixing the price of gas under certain circumstances. It surely could never have been intended that a wrong done for a length of time should perpetuate the injury, and make it impossible for the injured persons to obtain a remedy.

Mr. *T. Newbigging*, C.E., Consulting Gas Engineer, of Manchester, examined by Mr. NASH, said that owing to the straggling character of the Company's district a comparatively large expenditure was required on capital account, and about £5000 more would be needed to complete the extensions now in progress. The absolute cost of the production of gas in 1879 was 25·49d. per 1000 cubic feet. Allowing, however, for the creation of a reserve-fund by setting £1000 aside out of the profits, would increase the cost by 3·61d. per 1000 feet. The amount required to pay the maximum dividends would represent 16·93d. per 1000 feet, which would raise the cost to 46·03d. There were, however, a number of miscellaneous receipts which represented 0·65d., which would leave the cost of gas to the consumer 45·38d., or 3s. 9½d. Deducting, however, the charge for the reserve-fund, and adding interest for the fund which it was contended ought to have been previously set aside, the cost would be 3s. 4½d. This did not include any allowance for depreciation. The surplus profits in 1876, after paying the maximum dividend and putting aside £500, were only £469 17s. 4d. Mr. Aldred was, in his opinion, mistaken when he stated that a charge of 3s. 6d. per 1000 feet in 1879 would have allowed the payment of the maximum dividends, for in that case there would have been a deficiency of £361. In making this calculation, however, he omitted any reference to the item of £17,000 given by Mr. Aldred as accumulated profits, or the £7800 admitted by Mr. Smith to have been divided amongst the Shareholders. If the sum of £17,000 were to be treated as bearing interest at the rate of 4 per cent., then that would reduce the price of gas by 2½d. per 1000 feet. No other company supplied gas equal in quality to that supplied by the Stretford Company. The one

that came next was Liverpool, where the gas supplied was equal to 21-candle power; in Manchester the gas was equal to about 20 candles, and in Salford to 19 or 20 candles. The Stretford Company were not obliged to supply anything beyond gas of 14-candle illuminating power, which would cost them probably 2s. 6d. per 1000 feet.

In cross-examination by Mr. TAYLOR, witness said that, deducting all the items to which objection was taken in estimating the cost of the production of gas of the present quality, the price to be charged in order to allow maximum dividends to be paid would be 3s. 2½d. per 1000 feet.

Mr. LOCOCK WEBB said this was the case for the Company, and it only remained for him to submit that the Court had no jurisdiction, under the 35th section of the Gas-Works Clauses Act, to deal with the matter in any way, because it appeared from the evidence that the reserve-fund of the Company, which should have been £10,000, and should have been invested as mentioned in the Act, had not been invested. If the Court should be of a contrary opinion, then he should submit that the profits of the undertaking of the Company during the preceding year had not exceeded the prescribed amount.

The CHAIRMAN announced that the Court would postpone judgment until the 27th inst.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

The Chief Gas Examiner for the Metropolis (Dr. Williamson, F.R.S.) has just presented his report on the examinations of the gas supplied by The Gaslight and Coke, Commercial, and South Metropolitan Gas Companies, during the quarter ending the 30th of September:—

I. *With respect to Illuminating Power.*—The following is the average for the quarter at each of the stations, in standard sperm candles:—

	Average.
The Gaslight and Coke Company—	
Beckton (common gas)	17·4
Friendly Place ,,	17·0
Millbank Street (cannel gas)	21·2
Ladbroke Grove (common gas)	17·9
Devon's Road ,,	17·3
Carlyle Square ,,	16·8
Camden Street ,,	17·5
Graham Road ,,	17·1
Commercial Gas Company—	
Parnell Road (common gas)	17·3
Wellclose Square ,,	16·9
South Metropolitan Gas Company—	
Hill Street, S.E. (common gas)	16·7

The average for the quarter has at all the stations of the three Gas Companies been above the requirements of the Acts of Parliament.

II. *As regards Purity.*—Sulphuretted hydrogen has not been present in the gas. The proportions of sulphur in other forms than this were as follows:—

Grains of Sulphur per 100 Cubic Feet of Gas.

	Average.
The Gaslight and Coke Company—	
Beckton	10·2
Friendly Place	9·4
Millbank Street	9·9
Ladbroke Grove	11·1
Devon's Road	8·6
Carlyle Square	13·9
Camden Street	11·3
Graham Road	11·4
Commercial Gas Company—	
Parnell Road	9·7
Wellclose Square	7·4
South Metropolitan Gas Company—	
Hill Street, S.E.	10·7

The average for the quarter has been at all the stations considerably below the limits fixed by the Acts of Parliament.

Ammonia has been present in the gas to a slight extent at all the stations, with the exception of Beckton, North Woolwich. The average has been far below the parliamentary maximum.

The testing-station at Graham's Road, Dalston, was closed for repairs from the 24th to the 29th of September.

THE TESTING-PLACES FOR THE CHARTERED COMPANY'S GAS.—The Winter Instructions of the Metropolitan Gas Referees make certain alterations in the places for testing the gas of the Chartered Gas Company. They will in future be 10 in number. The old stations at Beckton and Friendly Place, Mile End Road, are abolished; those at (1) Millbank Street, (2) Ladbroke Grove, Notting Hill, (3) Bruce Terrace, Devon's Road, Bromley, (4) Carlyle Square, Chelsea, (5) Camden Street, and (6) Graham Road, Dalston, are retained; while the four new ones are (7) No. 3, Jewry Street, Aldgate, (8) No. 10, King Street, Cloth Fair, (9) No. 1, Dorset Buildings, Salisbury Square, Fleet Street, and (10) No. 47, Kingsland Road.

METROPOLIS WATER SUPPLY.

The following are the returns made by Dr. C. Meymott Tidy, M.B., &c., on the Composition and Quality of the Metropolitan Waters in September, 1880:—

[The results are stated in grains per Imperial gallon of 70,000 grains.]

Names of Water Companies.	Total Solid Matter.	Oxygen required by Organic Matter, &c.	Nitrogen.— As Nitrates, &c.	Ammonia.	Hardness (Clark's Scale). Before Boiling.	Hardness (Clark's Scale). After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	19·33	0·056	0·126	0·000	14·8	3·0
West Middlesex	19·02	0·041	0·125	0·000	14·8	2·8
Southwark and Vauxhall	19·63	0·118	0·125	0·002	14·5	2·8
Chelsea	18·91	0·042	0·125	0·000	15·0	2·8
Lambeth	19·80	0·048	0·125	0·000	15·0	2·8
Other Companies.						
Kent	30·56	0·000	0·437	0·000	21·2	5·1
New River	20·78	0·056	0·135	0·000	15·4	3·0
East London	18·82	0·023	0·104	0·000	15·0	3·0

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, Southwark and Vauxhall.

COURT OF COMMON COUNCIL.—The following notice of motion has been given by Mr. Pearse Morrison, for consideration at the meeting of the Court of Common Council on the 21st inst.:—"That it be referred to the Gas and Water Committee to consider the advisability of offering a substantial premium or premiums to Engineers and others for the best plan or mode of supplying the Metropolis with water, having especial regard to sufficiency, quality, and economy; and to report thereon fully to this Court."

HALIFAX CORPORATION GAS SUPPLY.

REDUCTION IN THE PRICE OF GAS.

At the Meeting of the Halifax Town Council on Wednesday last—the MAYOR (Alderman Bairstow) in the chair, the Gas Committee reported that they had resolved on reducing the price of gas from 3s. 4d. to 2s. 4d. per 1000 feet to consumers within the borough, and from 4s. 8d. to 3s. 8d. per 1000 feet to those outside the borough, with the usual discount in each case, such reduction to take effect from the 1st of January next. It was also resolved that in preparing future estimates of the Committee, a sum of £2500 be provided for as a profit, representing 1 per cent. on the estimated amount of capital account, and if any profit should be made beyond this sum, it should be placed to the credit of an account to be called the "stores account," and when this account reached £7000, all surplus balances should be transferred to the credit of the gas department, and be dealt with in the estimates of the coming year.

Alderman RILEY moved the confirmation of the proceedings, and submitted the following figures showing the financial position of the works yearly since 1874. The figures represent the price per 1000 feet of gas sold:—

——	1874.	1875.	1876.	1877.	1878.	1879.	Estimate. 1880.	Estimate. 1881.
	d.	d.	d.	d.	d.	d.	d.	d.
Coal and cannel	19·61	19·02	15·36	13·39	12·33	11·60	9·77	9·93
Less residuals	11·14	10·38	8 83	10·72	9·75	10·09	10·00	9·06
Net cost of coal	8·47	8·64	6·53	2·67	2·58	1·51	0·23	0·87
Working expenses—								
Salaries and wages	7·12	6·50	6·23	6·47	6·09	6·10	6·17	5·86
Purifying materials	1·00	0·52	0·73	0·72	0·22	0·30	0·13	0·16
Maintenance, retorts, &c.	4·07	4·97	3·76	3·19	3·07	1·48	2·17	19·8
General workmen, repairs, &c.	3·03	3·80	3·66	3·02	2·18	2·14	1·85	1·96
Miscellaneous expenses	2·47	2·38	2·30	1·89	1·88	1·85	1·74	1·68
Rates and taxes	3·74	3·48	3·75	3·44	3·68	2·96	2·77	2·49
	21·16	21·65	20·43	18·73	17·12	14·83	14·83	14·13
Less meter-rents	2·51	1·86	1·76	1·80	1·81	1·72	1·11	0·99
	18·65	19·79	18·67	16·93	15·31	13·11	13·72	13·14
Cost of gas at consumers meters	27·12	23·43	25 20	19·60	17·89	14·62	13·49	14 01
Profit—								
Interest on capital	10·19	10·02	9·41	9·69	9·71	9·99	9·42	8·64
Sinking-fund	1·88	1·77	3·62	1·64	1·64	1·56	1·43	1·33
Renewal account	1·48	4·59	1·40	3·05	3·03	2·83	2·66	—
Balance absorbed by borough-fund	5·98	2·47	3·56	6·64	4·57	8·40	9·95	2·50
Total profits	19·83	18·85	17·99	21·02	18·95	22·83	23·46	12·47
Price received per 1000 feet of gas sold	46·95	47·28	43·19	40·62	36·84	37·45	36·95	26·48

He added that there was a great increase in the consumption of gas for strictly manufacturing purposes, and he thought it very important that the Corporation should encourage the development of local industries by supplying them with cheap gas and cheap water. It was to be hoped the reduced price would lead to enhanced profit, as had been found to be the case in years gone by. He thought there was nothing to fear now from the electric light, nor did he think any system of lighting could at all compete with that of coal gas supplied at 2s. or 2s. 4d. per 1000 cubic feet. He was bound to say that, in obtaining the results achieved, there had been excellent management, and he could not do less than pay a compliment to the Manager, Mr. Carr, who was a gentleman who had the interests of the Corporation at heart. There was never any improvement introduced in the manufacture of gas but Mr. Carr felt it incumbent upon him to make himself master of the subject, and to use his knowledge for the benefit of the town. It had been mentioned to him (Mr. Riley) that with the gas at 2s. 4d. per 1000 feet Halifax would not be on an equality with Leeds, at 1s. 10d. When they took into account the illuminating power—Halifax was supplying 2 candles better gas than Leeds—and when he told them they were handicapped to the extent of 4d. per 1000 feet in the matter of interest and rates as compared with Leeds, he maintained they were supplying at a cheaper rate than the Leeds Corporation.

Alderman MIDGLEY most heartily congratulated the Gas Committee on what they had been able to accomplish. He had taken the statistics for a dozen years at least on all the points referred to by Alderman Riley, and he remembered that the lowest price they had ever had coal at was 1s. 5d. per 1000 cubic feet of gas made. They saw that now it was made for less than 10d., which was almost more than could be expected from works of this kind. During all the time he was in the Committee, the interest was about 10d. for every 1000 cubic feet of gas manufactured, and now, just after completing a very large addition to the works, capable of turning out as much gas as all the old works put together, the Council could actually lower the proportion of interest. He was well satisfied that next year there would be a very handsome surplus from the gas-works.

The MAYOR said he rejoiced with the Chairman of the Gas Committee and Alderman Midgley with joy unspeakable. The action now taken placed the Committee in this position: They were not reducing the price of gas to such a figure as would make the expenditure equal to the income, but they had taken this wise precaution—they were in the habit of borrowing money at 4 per cent., and were charging themselves with 5 per cent. He thought it a perfectly sound principle in a business of any kind, where they could borrow money at 4 per cent., and where the services were given free so far as the Gas Committee were concerned, that some acknowledgment should be shown at the end of the year for services rendered, and the 1 per cent. covered it.

Mr. BOOTH asked the Chairman of the Gas Committee to explain the stores account, which was to accumulate until it reached £7000.

Alderman RILEY said there were about £7000 worth of stores in connection with the works, and the Committee had no power to borrow money against that sum. Any surplus profit over and above the £2500 would be paid into the bank to the credit of this stores account until the sum amounted to £7000, as working capital.

The recommendations were then agreed to.

TRANSFER OF THE STROOD WATER-WORKS TO THE ROCHESTER CORPORATION.—At a special meeting of the Rochester Corporation on the 28th ult., the sum settled at which the transfer to the Corporation of the property of the Strood Water-Works Company—viz., £6700, with £445 for the removal of machinery and costs of the transfer—was to take place, was, on the motion of Alderman Foord, seconded by Mr. Belsey, ordered to be paid by the City Treasurer. This having been done, the transfer was completed.

LONDON GASLIGHT COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held last Wednesday, at the Freemasons Tavern, Great Queen Street, London—the GOVERNOR (Major Rohde Hawkins, Esq.) in the chair.

The SECRETARY (Mr. A. J. Dove) having read the notice convening the meeting, the corporate seal of the Company was affixed to the register of Proprietors, and the following report and accounts were presented:—

The accounts annexed to this report show the result of the manufacture and distribution of the Company's gas for the half year ending June 30, 1880.

A comparison of these accounts with those for the corresponding period of 1879 exhibits an increase in the rental for gas of £3829 15s. 6d.; but, on the other hand, there is a falling-off in the receipts for coke and breeze amounting to £4063 19s. 5d.

The profit and loss account, after providing for interest and dividend on preference capital, shows a balance of £20,517 11s. 5d., out of which the Directors recommend that a dividend at the rate of 10 per cent. per annum be declared on the ordinary capital of the Company, such interest and dividends to be paid on Oct. 15, 1880.

The plant in works and mains has been well maintained, and ample provision made to meet the requirements of the public.

The Bill in Parliament, promoted by the Company for the purpose of increasing the consumption of gas by letting on hire stoves and engines for motive power, and referred to in the last report, received the Royal Assent on Aug. 2, 1880.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, *on June* 30, 1880.

Acts of Parliament relating to the Raising of Capital.	Description of Capital.	Maximum Dividend Authorized.	Number of Shares Issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Arrears of Calls.	Remaining to be called up.	Total Amount Authorized.
15 Vict., cap. 82	Ordinary stock.	10 per cent.	Stock	Stock	Stock	£390,000	..	..	£390,000
	2nd pref. ,, .	6 ditto.*	Do.	Do.	Do.	5,650	..	..	5,650
	3rd ditto ,, .	6 ditto.*	Do.	Do.	Do.	1,500	..	..	1,500
	1st ditto ,, .	6 ditto.	Do.	Do.	Do.	150,000	..	..	150,000
29 Vict., cap. 55.	A ditto shares .	6 ditto.	12,000	£25 0 0	£20 and £1 5s.	188,307	..	£111,693	300,000
20 & 21 Vict., cap. 73	1 & 2 Deb. stks.	6 & 5 ditto.	Stock	Stock	Stock	26,613	..	..	26,613

* With option of conversion.

No. 2.—STATEMENT OF LOAN CAPITAL.

Acts of Parliament authorizing the Loan Capital.	Description of Loan.	Rates per Cent. of Interest.		Total Amount Borrowed.	Remaining to be Borrowed.	Total Amount Authorized.
		4½ per Cent.	5 per Cent.			
15 Vict., cap. 82 29 Vict., cap. 55	Bonds, 4½ per cent. Debenture stock, &c.	£89,862	£7,687	£97,549	£81,305	£91,667 100,000

No. 3.—CAPITAL ACCOUNT.

Dr.			Cr.			
—	—		Description of Capital.	Certified Receipts to Dec. 31, 1879.	Received since that date.	Total Receipts to June 30, 1880.
To Expenditure to Dec. 31, 1879	£831,535 3 10		By Ordinary stock	£389,800 0 0	£200*	£390,000 0 0
Balance	10,563 5 0		2nd Preference ditto.	5,850 0 0	†	5,650 0 0
			3rd ditto ditto.	1,500 0 0	..	1,500 0 0
Total expenditure.	£842,098 8 10		1st ditto ditto.	150,000 0 0	..	150,000 0 0
Balance	17,521 6 2		A ditto shares, £25 each, including amount received in anticipation of calls	187,047 10 0	1,260 0 0	188,307 10 0
			1st & 2nd Debenture stocks, under 20 & 21 Vict., cap. 73	26,613 5 0	..	26,613 5 0
			Bonds, &c.	68,987 0 0	‡	66,987 0 0
			4½ per cent. debenture stock	30,562 0 0	..	30,562 0 0
	£859,619 15 0			£860,359 15 0	..	£859,619 15 0

Note.—*† £200 converted into ordinary stock. ‡ £2000 paid off.

No. 4.—REVENUE ACCOUNT, *for the Half Year ended June* 30, 1880.

To Manufacture of gas—			By Sale of gas—		
Coals, including dues, carriage, unloading, and trimming (see statement No. 8)	£56,957 0 11		Common gas, per meter, at 3s. 3d. per 1000 cubic feet	£110,551 17 1	
Salaries of Engineers, Superintendents, and other Officers at works	2,374 7 5		Public lighting, and under contracts—		
Wages (carbonizing)	11,592 0 1		Common gas (See statement No. 10.)	10,604 11 8	
Purification, including £1150 0s. 7d. for labour	2,039 7 11			£121,156 8 9	
Repairs and maintenance of works and plant, materials, and labour, less £297 14s. 7d. for old materials	21,411 5 1		Rental of meters	2,237 1 6	
	£94,374 1 5			£123,393 10 3	
Distribution of gas—			Residual products—		
Salaries and wages of Officers (including Rental Clerks)	£2,474 2 3		Coke, less £2264 1s. for labour and cartage	£17,795 5 0	
Repairs, maintenance, and renewals of mains and service-pipes, including labour	8,970 4 2		Breeze, less £316 12s. 11d. do.	951 12 1	
Repairs and renewals of meters	1,587 12 9		Tar, less £18 15s. do.	6,919 7 9	
	13,031 19 2		Ammoniacal liquor, less £24 1s. do.	7,165 18 4	
Public lamps—				£32,832 3 2	
Lighting and repairing	2,077 15 8		Rents receivable	1,278 10 0	
Rents, rates, and taxes—			Transfer fees	11 15 0	
Rents payable	£623 17 6				
Rates and taxes	4,610 14 5				
	5,234 11 11				
Management—					
Directors allowance	£1,250 0 0				
Company's Auditors	75 0 0				
Salaries of Secretary, Accountant, and Clerks	1,367 12 8				
Collectors commission	2,308 9 5				
Stationery and printing	457 10 8				
General charges	538 16 9				
	5,997 9 6				
Law charges	370 14 4				
Bad debts	692 8 2				
Depreciation-fund for works on leasehold land	100 0 0				
Superannuations, sick allowances, and gratuities	585 18 8				
Total expenditure	£122,464 18 10				
Balance carried to net revenue account, No. 5	35,050 19 7				
	£157,515 18 5			£157,515 18 5	

No. 5.—PROFIT AND LOSS (NET REVENUE ACCOUNT).

Interest on bonds, 4½ per cent. debenture stock, &c., to June 30, 1880	£2,239 5 5	Balance from last account	£24,979 5 8
Dividends on preference capital	11,100 6 2	Less dividend on ordinary capital for the half year ending Dec. 31, 1879	19,490 0 0
	£13,339 11 7	Amount carried to reserve-fund to Dec. 31, 1879	£5,489 5 8
Interest on temporary loans	443 16 7		
Redemption-fund, reserve per London Gaslight Act, 1857	750 0 0	Amount from revenue account, No. 4	£35,050 19 7
Balance applicable to dividend on ordinary capital	20,517 11 5		
	£35,050 19 7		£35,050 19 7

No. 6.—RESERVE-FUND.

Balance on June 30, 1880	£76,762 7 4	Balance on Dec. 31, 1879	£70,200 10 9
		Interest on amount invested	1,072 10 11
		Amount brought from net revenue for the year 1879	5,489 5 8
	£76,762 7 4		£76,762 7 4

No. 7.—DEPRECIATION-FUND (FOR WORKS ON LEASEHOLD LAND).

Balance on June 30, 1880	£2,411 12 10	Balance on Dec. 31, 1879	£2,277 7 10
		Interest on amount invested	34 5 0
		Amount brought from revenue account for the half year ending June 30, 1880	100 0 0
	£2,411 12 10		£2,411 12 10

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1879.	Received during the Half Year.	Carbonized during the Half Year.	Used for Sundries during the Half Year.	In Store, June 30, 1880.
	Tons.	Tons.	Tons.	Tons.	Tons.
Common	7,341	83,735	74,389	24	16,663
Cannel	1,172	4,313	4,047	..	1,438

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

Description of Residual.	In Store, Dec. 31, 1879.	Made during the Half Year (estimated).	Used during the Half Year (estimated).	Sold during the Half Year.	In Store, June 30, 1880.
Coke, chaldrons of 36 bush.	4,158	76,340	19,613	60,405	480
Breeze ,, ,, ,,	689	10,055	..	10,577	167
Tar, gallons	157,000	828,822	..	869,822	116,000
Am. liqr., butts of 108 gals.	1,963	18,738	..	20,368	333

No. 10.—STATEMENT OF GAS MADE, SOLD, &c.

Description of Gas.	Quantity made (measured by Station Meters).	Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
		Public Lights and under Contracts (estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	782,481	51,552	680,319	731,871	9,006	740,877	41,604	5,562

BALANCE-SHEET.

To Capital—				By Cash at Bankers and in hand		£13,814 14 11
For balance, per account No. 3	£17,521 6 2			Amount invested—		
Net revenue—				Reserve-fund	£69,260 11 4	
For balance, per account No. 5	20,517 11 5			Redemption-fund	7,390 0 6	
Reserve-fund—				Unclaimed dividends	4,871 2 7	
For balance, per account No. 6	76,762 7 4			Depreciation-fund (for works on leasehold land)	2,045 4 0	
Depreciation-fund (for works on leasehold land)—						83,566 18 5
For balance, per account No. 7	2,411 12 10			Stores on hand, viz.—		
Redemption-fund	9,826 0 0			Coals	£13,476 19 4	
Bond, 4½ per cent. debenture stock, &c., interest for amount due to June 30, 1880	1,439 18 1			Coke and breeze	165 0 0	
Preference dividends, ditto	11,100 6 2			Tar and ammoniacal liquor	1,329 3 4	
Unclaimed dividends	5,838 5 7			Sundry stores	4,289 17 9	
Sundry tradesmen and others, for amount due for coals, stores, and sundries	27,125 15 4					19,261 0 5
				Accounts due to the Company—		
				Gas and meter rental, quarter ending June 30, 1880	£35,615 18 3	
				Ditto arrears outstanding	6,386 5 1	
					£42,002 3 4	
				For coke and other residual products	13,022 18 2	
				Sundries	875 7 8	
						55,960 9 2
	£172,543 2 11					£172,543 2 11

The GOVERNOR said: Before moving that the report be received and adopted, I should like to say a few words. You have this report before you, and our friend the Editor of the JOURNAL OF GAS LIGHTING says it has a "fine old flavour" about it. Well, I am glad it has this fine old flavour, because the flavour is one of continued success. For some years past we have been fortunate enough to earn sufficient money to pay our full dividends, and I am thankful to say also from year to year to lay by a very substantial little sum towards our reserve-fund, so as to give additional security against any evil time that may fall upon us. And not only is the flavour of the report satisfactory as far as we Shareholders are concerned, but I think it must also be satisfactory to the public. Not many years ago the price we charged for our gas was 4s. 6d. per 1000 cubic feet; then it came down to 4s., 3s. 9d., 3s. 6d., and it is now 3s. 3d.; and I am happy to be able to announce that the Directors think they will be fully justified in reducing the price to 3s. from the 1st of January next. I consider, therefore, that the flavour is good all round. I am aware that some of the Shareholders are of opinion that it would be an advantage if they could participate in the sliding scale, and obtain a little more dividend in this way; but I think that there is a great deal to be said on both sides. We are all aware that you might receive a little more dividend; but a higher dividend means sometimes rather a lower security; and I think the Shareholders should consider this question very materially before they press for any great alteration in our present system. If you accepted the sliding scale, you must remember that in hard times, when prices of coal are high, and you cannot get very good prices for some of your products, your dividends are liable to material reduction; and, as I said before, security is of more importance than a high rate of interest. Now, without in the slightest degree cavilling, or finding fault, or depreciating the security offered by those Companies which are under the sliding scale, I think the public do not quite understand how very much better is the security of a Company like ours, living and working under the Acts of Parliament by which we work. If, now, you take the sliding scale Companies—take The Gaslight and Coke Company—they are selling their gas, I believe, at 3s. 4d. per 1000 cubic feet. Their maximum price is 3s. 9d.; that is to say, they have a margin of safety of 5d. or 6d.—I do not quite know what is their price. If you take the large amalgamated Company on the south of the Thames, you find them selling their gas at 3s., and they have a maximum price of 3s. 6d. There, again, 6d. is their margin of safety. If they charge beyond this, they must pay a dividend below 10 per cent. If you take our Company from the 1st of January next, we shall sell our gas at 3s.; but our maximum price is 4s. 6d. Our Act enables us to go to 4s. 6d., in order to cover any deficiency that may occur. Therefore our margin of safety is 1s. 6d. More than this, we are selling 16-candle gas, while our Act only requires us to sell 12-candle. This is 4 candles to the good, and that is another 6d. of margin; so that of our own will we have a margin of 2s. against a margin of 6d. in the case of the Companies working under the sliding scale. But we have even a further protection, because if, under any peculiar circumstances—I do not suppose they will occur, but if they did take place, and we found we could not pay the dividend of 10 per cent. on our ordinary stock, even charging 4s. 6d. per 1000 feet, our Act empowers us to go to the Secretary of State for the Home Department, and ask him to give us a still higher price; and however much he might dislike to do so, if we could make a real, honest, clear statement, I believe he would be bound to do it. Therefore I wish you to understand clearly that 10 per cent. with such a large margin of security is better than 11 per cent., or even 11½ per cent., with a much smaller margin. A subject I wish also to draw the attention of every Shareholder to is the electric light. You know that from time to time we have "scares" about the electric light. Now, we only meet every six months, and the Directors cannot call you together if there happens to be a fresh scare; therefore, all I say is, do not pay the slightest attention to it. The most scientific people will tell you that there is business, both at the present time and in the future, for gas manufactories—or, rather, for us as distillers of coal—which is quite irrespective of lighting by electricity. I believe myself most firmly that if the electric light were brought forward and made of more use for lighting large spaces and buildings, there would still be business for us, independently of the loss which might thus be occasioned to us, and that this business would enable us to pay our dividend with the greatest possible ease. The fact is that the use of gas as an illuminating agent might entirely cease, but it would remain as a heating agent. You must have motive power for engines, and we see from day to day that gas is becoming more popular for driving engines, cooking, warming, and purposes of this sort; and if you take this into consideration, with the fact that the residual products—tar, ammoniacal liquor, and such things—are rising in value year by year, I hope you will not be frightened at anything you hear about the electric light. Bear in mind that you have a most valuable property, and if any injury is done to it, it will be through your being afraid. I hope you will understand that the Directors are not sitting down supinely, and letting these things happen without taking notice of them, but that they are considering your business in all its bearings, and striving, to the utmost of their power, to carry on that business to the best advantage. I now move—"That the report of the Directors and the accounts now laid before the meeting be received and adopted."

Mr. HOBSON, in seconding the motion, said that as a Director of the Sheffield United Gas Company for 22 years, he could state that it was also an old-fashioned Company paying 10 per cent., but their policy had been different from what the Governor said might be the London Company's, with their wide margin, and selling gas at 3s. per 1000 cubic feet. This Company had theoretical—in fact, legal powers to go up to 4s. 6d., and to apply for a higher maximum if that was not sufficient to pay their 10 per cent. At Sheffield they had to go through the coal famine of 1873-74 something like the London Companies had; but if there ever was a blunder made on the part of members of some London Gas Companies Boards, it was in rushing up to a 5s. charge. The Sheffield Company's price was at that time 3s. 1d. per 1000, and, as one of the Directors of the Company, he signed a contract for coal at an increased price. It cost them £10,000 more than the previous contract, but they did not raise the price of gas. It remained at 3s. 1d., and when they were able, when coal was cheaper, they reduced their price. At present it was 2s. 4d., going down to 2s. for the public lights; and their reserve-fund was quite full—10 per cent. Their policy, therefore, was the reverse of what the Governor had foreshadowed in the event of certain contingencies. The Company, however, could not go to 4s. 6d. without raising a perfect storm of dissatisfaction. The Gaslight and Coke Company created it by rushing up to 5s., and the worthy Governor must be aware that it would be very unsatisfactory to raise the London Company's price from 3s. to 4s. 6d. He did not, indeed, believe that the Board would consent to it. As to the illuminating power of the gas, the days were gone by when the public would be satisfied with 12 candles, and the Directors were perfectly aware of this, and, therefore, felt that it was better to give 16-candle gas. They showed by their proceedings that the days for the exercise of the theoretical powers referred to by the Governor were gone by. He was glad they were doing more for the public, and were able to supply gas at 3s. per 1000 feet, and give 16-candle power. This Company, like the Sheffield Company, were working under the old Acts; but the latter, seeing that they would never get such powers again, had done what he had recommended this Company to do—converted their debenture stock into share capital, paying 10 per cent. He saw that the Company had some 4½ per cent. bonds under their old Acts, and they had the power to pay them off with share capital, which could be created for this specific purpose. He was aware that if they did so they could not borrow any more money at 4½ per cent., but must call on the Shareholders for fresh capital. They might say their margin of profit was not enough to enable them to turn 4½ per cent. into 10 per cent., but with the present low price of coal there was margin enough in a gas company to do pretty well what they pleased; and if it required to take £3000 or £4000 from the reserve-fund they could do so, as the Sheffield Company did. The stock could be created to pay 10 per cent., and thus they could give the Shareholders 80 or 90 per cent. bonus—the difference between par and the selling price. They might as well obtain this privilege while they could. The time would come when they would probably have to ally themselves with The Gaslight and Coke Company or the South Metropolitan Company. He had between £20,000 and £30,000 in those two Companies jointly, and he was quite satisfied with his investment, deriving 11½ per cent. on the old, and 11 per cent. on the "B" stock of the South Metropolitan Company, and 11 per cent. on the stock of The Gaslight and Coke Company. He knew the margin was not so great between 3s. and 4s. 6d. and 3s. and 3s. 9d.; but coal must go to a panic price before they could think of charging 4s. 6d. He knew he was speaking openly. In the Sheffield Company they had thought it well to sell gas at an average of 2s. 3d. per 1000 feet; but the full 10 per cent. dividend and the full reserve-fund had been maintained, besides carrying forward a balance. He confessed that he was not fully in love with the new system, and he quite agreed with the Governor as to the advantages of a solid 10 per cent. He did not know that he did not feel quite as well off in the Sheffield Company, with his 10 per cent., as with his investment in the London Companies. He again urged the Board to issue ordinary stock for the debentures.

Mr. JONATHAN DENNY thought that had the Governor stated that an amalgamation was on the *tapis*, they would have received the announcement with great delight, and in this case they would have to come under the sliding scale, of which the Governor seemed so much afraid. The Company was in such a flourishing state that he (Mr. Denny) was sorry they had not seen their way to take the lead, and "go in" for the extra dividend. He saw that their reserve-fund was full, and he did not know what they were to do with the extra money but give it to the public, who, he considered, had had enough.

The motion—that the report be received and adopted—was then put and carried unanimously.

The GOVERNOR (to Mr. Hobson): I ought to have told you that as to the question of raising the price to 4s. 6d. per 1000 being an obsolete proceed-

ing, we did it in 1873 and 1874, with great success to ourselves, and the public did not say that there was anything unreasonable in our doing so.

Mr. HOBSON: That 5s. price was the beginning of this new system, and the selling of the shares by auction.

A resolution authorizing the payment of the dividends recommended in the report was then carried unanimously.

The GOVERNOR: Before we part, I hope you will agree with the Directors in passing a vote of sincere thanks to the Secretary, Engineer, and other Officers of the Company, for their labours on behalf of our undertaking. Our business is, I believe, as well done as that of any concern in London. Every one of our officers devotes himself thoroughly to it, and as they are all gentlemen of considerable ability, their energies produce very satisfactory results. The Directors therefore think it is but right that you should pass a vote of thanks to them for their attention to our work.

Mr. ROBERT RAWLINSON, C.B., seconded the motion, which was carried unanimously.

The SECRETARY, in acknowledging the vote, said it was at all times a great encouragement to the officers to receive the approval both of the Shareholders and the Directors, particularly when the latter were so intimately acquainted with all their work, and the way in which it was carried out.

Mr. W. FORD, in proposing a vote of thanks to the Governor and Directors, observed that he would take the opportunity of saying a few words on a subject referred to by one of the Shareholders and by himself at the last meeting—the subject of amalgamation. When Mr. Hobson referred to some observations made by the Governor, he thought the Governor himself was probably, by anticipation, replying to a speech which he (Mr. Ford) had *not* made. His opinion was that the Governor was calling their attention to the advantages possessed by the Company over other Companies with which it had been suggested that an amalgamation should be made. For his part, after a long interview on the subject with the Governor on the previous day, he thought it might be very well left to stand over for the present, because he was certain that, without the Directors or Shareholders interference on the part of this Company, it would be brought about by the course of events, and every one of those advantages which they possessed would be appreciable factors in fixing the terms on which amalgamation would take place. For the present, therefore, he was prepared personally to allow events to take their course, but sooner or later he maintained that all the larger Companies would find it necessary to amalgamate for mutual protection, in order to secure for themselves the continuance of the monopoly which they possessed, and in order to continue the payment of the 10 per cent. which they had hitherto enjoyed. What they, as a gas company, had, in his opinion, to look for at present was to secure the 10 per cent. His notion was that any attempt to obtain a further percentage on their capital would result disastrously to those who endeavoured to promote it. He had a large interest, and therefore spoke feelingly. He was not speaking on behalf of the public, but the public was not a factor which they could ignore in this matter. He had slightly departed, perhaps, from the resolution which he rose to propose, but his remarks were relevant in this sense, as indicating the confidence which he and all the Shareholders felt in the Board.

Mr. WARD seconded the motion, and it was carried unanimously.

The GOVERNOR: Gentlemen, on behalf of myself and co-Directors I beg to thank you very much for the honour you have conferred on us. My friend Mr. Ford says he went a little out of the way in proposing the resolution, and perhaps you will therefore allow me to remind you of what I said on a previous occasion when the question of amalgamation was brought forward. I have always said that if I thought a proper and fair offer was made to this Company for amalgamation, then, here we are. We are a mercantile company—we are ready to sell at a price; but I put this before you: I think your security is better than that of the Companies who would wish to amalgamate with us; and therefore I think if those Companies wish to amalgamate, they can have us, but I haven ever yet had a fair price offered.

Mr. G. LIVESEY: How do you know they wish to buy you?

The GOVERNOR: Because they would not go to the Board of Trade and talk about it unless they did.

The proceedings then terminated.

LEICESTER CORPORATION GAS AND WATER SUPPLY.

At the Meeting of the Leicester Town Council on Tuesday, the 28th ult. —the MAYOR (Alderman Bennett) in the chair—the reports of the Gas and Water-Works Committees for the first half of this year were presented.

The Gas Committee reported as follows:—

The Gas Committee have to report that the accounts of this undertaking for the half year ending the 30th of June last have been submitted to them, from which it appears that the net profit, after paying interest on the mortgage debt and dividends on the debenture stock issued as the consideration of the purchase of the concern, and upon the new stock issued, is £4117 1s. Out of this sum has been paid £1002, being the half year's amount for sinking-fund on the original capital debt of £476,651 12s. 6d., leaving a balance of £3815 1s., which will be payable to the general district-fund at the close of the current financial year.

The reduction in the price of gas, as approved by the Council in September last, has had the effect of reducing the balance by about £2000, and the half year has also borne the expenses of the gas exhibition and of the renovation of a large gasholder.

Mr. DOWNING, in moving the adoption of the report, said it was one for the six months of the year wherein the smallest amount of business was done. The net balance for the half year was £3815 1s. 6d., as against £5773 7s. 2d. twelve months ago. He might direct the attention of the Council to the various changes which had caused the difference in the profits. The charges on capital account were this year £1351 6s. 5d. more than for the corresponding half of last year, and the Council had lost £2000 through the reduction in the price of gas, while the repairs to a gasholder had amounted to £409. These sums, with the cost of the gas exhibition held in April last, amounted to about £4000, which was an actual charge on the profits. If this sum were added to the £3815, it would show a satisfactory result of the half year's business. This result had been obtained in times of bad trade, and therefore he hoped that with an improvement the Gas Committee would, at the end of the next six months, have a more satisfactory report to present.

Mr. CLEAVER seconded the motion, and it was carried.

The report of the Water-Works Committee was as follows:—

The Water Committee have to report that the accounts of this undertaking for the half year ending the 30th of June last, have been submitted to them, from which it will be observed that the net profits, after paying interest on the mortgage debt and dividends on the debenture stock issued as the consideration for the purchase of the concern, is £2557 18s. 8d. Out of this sum has been paid £767, being the half year's amount for sinking-fund on the original capital debt of £452,434, and leaving a balance of £1790 18s. 8d., which your Committee recommend should be added to the reserve-fund, at present amounting, with interest, to £2396 0s. 8d., but by the Transfer Act authorized to amount to £3000. The balance for the corresponding half year was £1442 4s. 5d., and for the half year ending the 31st of December last £1735 19s. 5d., the increased balance of the present over the preceding half year being £821 19s. 3d.

Your Committee feel justified in hoping that the result of the working of the department for the half year will be satisfactory to the Council, and the best guarantee of their continued vigilance.

Alderman BARFOOT, in moving the adoption of the report, pointed out that the profits from the undertaking were gradually, but surely, increasing. The Council now, he said, supplied something like 24,264 houses in the town. During recent years the consumption of water per head of the population had sensibly diminished. When the Corporation first took over the management, the proportion was 26 gallons per head; now it had been reduced to 23½ gallons, out of which the Midland Railway consumed 2½ gallons per head of the population. He thought the Council would therefore see that vigilance was being exercised in the management.

Mr. G. GREEN seconded the motion, which was carried, and the Council passed to the consideration of other business.

FINAL MEETING OF THE DERBY WATER-WORKS COMPANY.

The Final Meeting of the Shareholders of this Company was held on Friday, the 1st inst.—Mr. G. GASCOYNE in the chair.

The SECRETARY (Mr. J. Walker) read a statement of the accounts, and the Directors report, which was as follows:—

The Directors have much pleasure in laying before the Shareholders a final balance-sheet of the Company's accounts, which they trust will be considered satisfactory.

The carrying into effect of the various clauses of the Act of Parliament transferring the water-works to the Corporation has been attended with many difficulties, and a very large amount of labour; but the Directors are pleased to be able to report that all questions arising under the Act have been settled and arranged without litigation, or without having recourse to the arbitration provided for by the Act.

The balance in hand on revenue account, including the sum of £484 6s. 4d., the balance of the contingent-fund, after payment of the dividend at the rate of 6½ per cent. per annum in July last, is £3441 6s. 6d., and Directors recommend that from this sum a dividend at the rate of one-half per cent. per annum, payable on the 15th inst., be paid to all classes of Shareholders, amounting to £343 4s. 9d., leaving a balance of £11 11s. 9d. in hand. The balance of capital assets in hand after paying the liabilities of the Company is £6703 1s., and the Directors recommend that a distribution at the rate of 7-16ths per cent. be made upon the amounts paid up on all classes of shares. This will amount to £595, and leave a balance in hand on this account of £75 3s. 1d.

The Directors have discharged all liabilities of the Company for which claims have been made. It is, however, possible that some claims may have been omitted to be sent, and the Directors recommend that the before-mentioned balances of £11 11s. 9d. on revenue account, and £75 3s. 1d. of surplus assets be retained for a period of two years, and that after the payment of any claims and expenses the balance remaining, if any, be distributed among the Shareholders. The balance of revenue will be divisible amongst holders of the original shares only, as the holders of the other shares will have received the full statutory dividend of 7 per cent. for the half year ended Dec. 31, 1879.

If the recommendations contained in this report are adopted, no further meeting of Shareholders will be required, and the Directors, in taking leave of the Shareholders, beg to express their thanks for the support they have on all occasions received from them, and for the confidence shown in their management of the undertaking, which they have reason to believe would bear a very favourable comparison with any similar undertaking in the kingdom.

The CHAIRMAN, in moving the adoption of the report, remarked that the Shareholders could scarcely grasp the details they had just heard read. The Directors were not able to obtain a settlement of matters until about two days before the meeting, and in so short a time it was with considerable labour that the accounts had been prepared. It was not so much the difficulty of agreeing with the Corporation, as that, having agreed, and when it came to a settlement, they had not been able to obtain the fulfilment quite so satisfactorily as they thought they ought to have done. They, of course, could not forget that the Corporation owed everything to them in the formation of the Company. They had done well and satisfied the public. They had not had to submit to opposition from any class with which they had been brought into contact. They had refused to raise their water-rates when they could easily have done so, and submitted to the loss of dividends, trusting to the Company's return to prosperity to recoup them for what they had lost. They were willing to wait, and not desirous of dashing immediately into an extra supply of water. They did not get new consumers compulsorily, but voluntarily, but the Corporation had greater facilities for bringing compulsory powers to bear. As there would not have been any water-works to buy but for the Shareholders, they did not deserve this small consideration from the Corporation. If it had not been for the opposition of the Corporation, they would never have been short of dividends, and then the Corporation stated that in consequence of the low state of the dividends they must take the works at a corresponding price. Their dividends would always have been full, if they had not spent so much money in going to Parliament, where the Corporation argued mainly that the water supplied was impure. Only recently the Corporation refuted all their arguments. A just Nemesis had overtaken them. At last they had, in consequence of some demented bellman going round and denouncing the quality of the water, to eat their own words. Through the columns of the press and out of the mouth of the Borough Analyst, they had declared that the water was not only moderate, but unspeakably good. In dealing with the accounts the Chairman said 6½ per cent. had already been paid on the revenue account, and would be supplemented by another half, so as to make it 7 per cent. arising from this source, and there was a balance on the assets amounting to 7-16ths per cent. If the Shareholders looked at it, under the old mode of distribution it would be equivalent to 7 per cent. on the 7 per cent. shares, and more than 10¾ per cent. on the 10 per cent. shares. This was really the result, though the law enjoined that it must be divided. He recollected a statement made in August, 1877, to the effect that in five half years the Company would recover their position. On that, the day of their dissolution, the five half years were completed. Although the statement he had made was not so satisfactory as it might have been, still it was satisfactory. During the last 15 years the average dividends on the shares entitled to 10 per cent. had been 9 6-14ths per cent. The 7 per cent. shares had only existed 11 years, and the average dividends had been 6 19-20ths per cent. If the maximum dividends had not been received on all occasions, the Shareholders had received so very nearly that amount that they might well be satisfied, on the whole, in parting with their property. He thanked the Shareholders for the support they had given the Directors at all times, and concluded by moving the adoption of the report.

Mr. HEFFORD seconded the motion, which was carried.

The CHAIRMAN then separately moved the declaration of the dividends, and the motions were unanimously adopted.

Mr. RICHARDSON proposed that the appropriation of the balance of revenue account and the surplus assets be left to the discretion of the Directors at the end of two years.

An amendment was proposed to the effect that the amount should be distributed among the old officers of the Company, but was eventually withdrawn, and the original motion agreed to.

The CHAIRMAN referred to the excellent manner in which the Directors had worked together. The Shareholders had given them their confidence for many years, and for this he thanked them heartily.

Mr. BOAM moved a vote of thanks to the Directors, believing they had done everything they possibly could for the interests of the Shareholders.

Mr. HEFFORD, in seconding the motion, said he never heard any one go away from their meetings dissatisfied. Complaints of the Company had always come from the Corporation. They, however, now had the water-works, and he hoped they would carry them on for the benefit of the town at large.

The proceedings then terminated.

MANCHESTER CORPORATION GAS SUPPLY.

REPORT OF THE GAS COMMITTEE FOR THE YEAR ENDING JUNE 24, 1880.

The operations of the Gas Committee during the past year, in common with those of other commercial undertakings, have been seriously influenced by the unfortunate depression which has existed in almost every branch of trade, and notably in the staple industries of Manchester. This is forcibly illustrated by the fact that the number of gas consumers in the Committee's district, as compared with last year, shows a decrease of 1042, or 1·41 per cent.

It is, however, satisfactory to note that while, on the one hand, the consumption of gas exhibits an increase of 0·38 per cent. only, as against last year's increase of 8·02 per cent., and the coke sales for the year have suffered to the extent of £1780, the Committee have been enabled, on the other hand, by taking advantage of the favourable state of the coal and cannel market, to reduce the expenditure under this head by £13,000. In addition to this the new contract for the purchase of the ammoniacal liquor, although it has only been in force during the latter half of the year, has brought in £7700 more than was realized by the same residual product in the corresponding period of the previous year.

Notwithstanding the increased difficulties of collection, the amount posted to the bad debts account is 34 per cent. less than that for the previous year; the total loss being only 0·2 per cent.

The continued heavy expenditure under capital account in connection with the new works has necessitated a large increase in the amount to be provided for interest. The total expenditure on account of street lighting is £23,336, or nearly £14,000 in excess of the amount expended during the portion of the previous year subsequent to the introduction of the new arrangement.

The Committee, however, are pleased to report that the net result of the year's working enables them to place at the disposal of the Improvement Committee the sum of £52,000, but, in accomplishing this, assistance is needed from the reserve-fund to the extent of £1612 1s. 2d.

The important question of economy of labour is continuing to receive the earnest attention of the Committee, and it is believed that extensive retrenchment will be brought about in the expenditure under this head. The loss of gas by leakage is likewise being dealt with.

The Committee have carefully considered the question of a reduction in the price of gas, and they have unanimously resolved to recommend the Council to authorize a reduction of 2d. per 1000 feet within the city, and 2d. per 1000 feet beyond the city boundaries, and also a reduction of 2s. per lamp per annum in the price charged for public lights outside the city, to take effect from Dec. 25, 1880.

The reports of the Analytical Chemist and the Auditors are submitted, and the usual statistical statements are appended, viz.:—Appendix A, statement of lamp and private rentals; Appendix B, statement of gas transmitted from the works; Appendix C, table showing the number of meters in use; Appendix D, table showing gas-mains laid and taken up during the year; Appendix E, statement showing the amount of gross profit and the mode of its appropriation, &c., since 1862.

(Signed) JOSEPH LAMB, Chairman.

Gas Offices, Town Hall, Sept. 30, 1880.

"To the Chairman of the Gas Committee.

"Sir,—I have the honour to report to you that the average illuminating power of the Manchester gas during the past year has been equal to that of 21·32 London standard candles.

"The gas has been tested photometrically at the Gaythorn and at the Rochdale Road stations almost daily. The standard of comparison adopted has been the light of a London standard sperm candle burning at the rate of 120 grains per hour. The average of the highest readings of the photometer has been equal to 22·87 candles, and of the lowest 19·82 candles.

"The gas has been tested daily for sulphuretted hydrogen and for ammonia. It has been allowed to flow continuously through test solutions, and the amount of impurity in large volumes of gas has been determined when of sufficient quantity to allow of weighing. As the gas has passed through these solutions during the night as well as the day, and during Sundays as well as on other days, any negligence in the purification at these times would have been detected.

"The gas may be said to have been quite free from ammonia. On no occasion, at either station, has the evaporation of an acid solution through which upwards of 300 cubic feet of gas have passed, left more than a slight film of salt of ammonia on the surface of the containing vessel.

"The gas at Gaythorn station has also, with a few exceptional times of slight duration, been quite free from sulphuretted hydrogen.

"At Rochdale Road station the gas has more frequently shown the presence of sulphuretted hydrogen. The quantity in 100 cubic feet has rarely, however, been more than sufficient to produce a discoloration of the test solution.

"The carbonic acid in the gas has varied from 1¾ to 3 per cent. of the volume of the gas.

"Bisulphide of carbon vapour has been present in the gas in varying quantity. The range may be expressed by equivalents in sulphur of from 25 grains to 45 grains in 100 feet of gas.

(Signed) "JOHN LEIGH, M.R.C.S.L., Medical Officer of Health."

[The report of the Auditors was also appended.]

STATEMENT OF ASSETS AND LIABILITIES.

PERMANENT ASSETS.

Gaythorn station—			
Land, buildings, and apparatus, as per last report—			
Land	£30,467 16 10		
Buildings	60,824 19 10		
Apparatus	56,158 8 3		
		£177,451 4 11	
Less depreciation		5,240 13 5	
		£172,210 6 6	
One year's outlay to June 24, 1880—			
Buildings	£3,143 4 9		
Apparatus	2,291 12 2		
		5,434 16 11	
			£177,645 3 5
Rochdale Road station—			
Land, buildings, and apparatus, as per last report—			
Land	£31,805 4 10		
Buildings	110,336 3 6		
Apparatus	80,383 15 9		
		£222,725 4 1	
Less depreciation		8,440 12 8	
		£214,284 11 5	
One year's outlay to June 24, 1880—			
Buildings	£5,316 13 1		
Apparatus	9,805 17 0		
		15,352 10 1	
			229,637 1 6
Carried forward			£407,282 4 11

Brought forward			£407,282 4 11
Droylsden station—			
Land, buildings, and apparatus, as per last report—			
Land	£328 17 3		
Buildings	5,316 19 5		
Apparatus	5,809 7 0		
		£11,455 3 8	
Less depreciation		478 2 11	
			10,977 0 9
Bradford Road station—			
Land, as per last report	£116,315 16 5		
Buildings, ditto	56,583 7 2		
Apparatus, ditto	102,632 18 2		
		£275,532 1 9	
Less materials sold		43 11 6	
		£275,488 10 3	
One year's outlay to June 24, 1880—			
Land	£169 3 0		
Buildings	7,506 3 0		
Apparatus	60,471 9 1		
		68,146 15 1	
			343,635 5 4
Street-mains stores (Poland Street)—			
Land, as per last report	£1,406 0 0		
Buildings, ditto	1,563 19 9		
Apparatus, ditto	325 4 10		
		£3,295 4 7	
Less depreciation		78 16 5	
			3,216 8 2
Street-mains—			
Main-pipes, as per last report	£254,004 10 1		
Less depreciation	6,350 2 3		
		£247,654 7 10	
One year's outlay to June 24, 1880		13,052 17 5	
			260,707 5 3
Service-pipes—			
Service-pipes, laid as per last report		£28,941 16 6	
Moiety of one year's outlay, charged to capital account		1,608 0 4	
			30,549 16 10
Hired meters—			
Outlay, as per last report	£61,763 14 7		
Less depreciation	6,176 7 5		
		£55,587 7 2	
One year's outlay to June 24, 1880		9,660 9 2	
			65,247 16 4
Meter-proving apparatus—			
Outlay, as per last report		£67 10 11	
Less depreciation		6 15 1	
			60 15 10
Lamp department—			
Outlay, as per last report		£363 3 9	
Ditto, June 24, 1880		963 15 6	
			1326 19 3

FLOATING ASSETS.

Cannel, retorts, and other materials on hand	£53,670 13 0	
Gas-rents and sundry accounts due to the Committee—		
Revenue account	63,630 9 3	
Balance in bank, June 24, 1880	77,687 7 1	
Ditto in Treasurer's hands, June 24, 1880	2,806 9 5	
		197,794 18 9
		£1 320,798 11 5
Excess of assets, June 24, 1880	£568,982 0 11	
Ditto of assets, June 24, 1879	539,735 6 10	
Increase, being the amount charged upon profit and loss for the present year towards liquidation of the mortgage debt, and carried to capital account	£29,246 14 1	

LIABILITIES.

Mortgage debt	£538,512 5 10
Purchase of land, the purchase-money being left in the hands of the Committee at interest	1,750 0 0
Sundry accounts owing—	
Revenue account	12,617 11 1
Extension ditto	106,104 16 6
Deposits in hand	21,010 1 1
Interest on ditto	1,016 2 8
Reserve-fund	18,775 10 4
Amount payable to the Improvement Committee for the year ending June 24, 1880	52,000 0 0
Balance, being excess of assets	568,982 0 11
	£1,320,798 11 5

PROFIT AND LOSS ACCOUNT.

EXPENDITURE.

To Cannel		£157,454 10 6
Retort men's wages		29,254 4 9
Retorts, materials, and setting		5,680 7 6
Labourers wages and repairs of works—		
Gaythorn station	£7,809 7 2	
Rochdale Road station	9,012 12 10	
Droylsden	133 11 6	
Street-mains	6,283 6 11	
Repairs of hired meters	798 13 5	
		24,037 11 10
Purifying charges		5,159 12 8
Salaries		12,175 14 6
Collectors poundage		7,248 7 0
Chief and other rents, rates, and taxes		9,027 17 9
Income-tax		1,755 6 5
Amount transferred to capital account for depreciation of works		26,771 15 2
Stationery and advertising		1,011 17 4
Law expenses, receipt, postage, and deed stamps		409 6 11
Miscellaneous expenses		993 15 7
Clothing for inspectors		386 16 6
Subscriptions		57 15 0
Bad debts		803 6 2
Rent of offices		1,800 0 0
Balance		111,013 1 11
		£395,041 7 6
Interest on loans		£23,629 10 10
Do. on deposits repaid		253 13 8
Do. do. in hand		1,046 2 8
Amount transferred to capital account (sinking-fund set aside)		29,246 14 1
Expenditure on street lighting	£23,366 8 6	
Less gas not charged	16,917 6 8	
		6,449 1 10
Amount payable to Improvement Committee		52,000 0 0
		£112,625 3 1

PROFIT AND LOSS ACCOUNT—(*continued*).

INCOME.

By Gas-rental—			
Within the city—			
Private consumers	£218,083 12 3		
Meter-rents	4,243 10 7		
Gas consumed in public lamps not charged	£16,917 6 8 —		
		£222,327 2 10	
Beyond the city—			
Private consumers	£81,159 10 2		
Meter-rents	1,995 3 1		
Public lamps	7,250 8 2		
		90,405 1 5	
			£312,732 4 3
Coke			20,535 15 3
Tar			34,964 2 4
Ammonia water			26,615 11 1
Rents			193 14 7
			£395,041 7 6
Balance brought down			£111,013 1 11
Transfer from reserve-fund			1,612 1 2
			£112,625 3 1

GENERAL SUMMARY OF RECEIPTS AND EXPENDITURE ON CAPITAL AND REVENUE ACCOUNT.

RECEIPTS.

To Balance in bank, June 24, 1879	£100,798 9 2	
Ditto in Treasurer's hands, June 24, 1879	166 13 5	
Ditto of sums owing to and by the Committee, including stocks on hand, June 24, 1879	27,888 10 5	
Carried forward		£128,853 13 0
Brought forward		£128,853 13 0
Balance of profit and loss account, as per statement		52,000 0 0
Loans received		10 11 6
Materials sold (capital account), as per statement—		
Bradford Road station		43 11 6
Amount transferred from revenue account—		
For depreciation of works		26,771 15 2
Liquidation of mortgage debt		29,246 14 1
Balance of sums owing to and by the Committee, including stocks on hand, June 24, 1880		23,477 9 1
		£260,403 14 4

EXPENDITURE.

By Loans repaid		£12,078 12 2
Improvement Committee—		
Surplus for the year ending June 24, 1879		52,000 0 0
Expenditure on capital account—		
Gaythorn station	£5,434 16 11	
Rochdale Road station	15,352 10 1	
Bradford Road station	63,146 15 1	
Street-mains	13,052 17 5	
Service-pipes (one moiety)	1,608 0 4	
Hired meters	9,660 9 2	
Lamps	963 15 6	
		114,219 4 6
Balance in bank, June 24, 1880	£77,637 7 1	
Ditto in Treasurer's hands, June 24, 1880	2,856 9 5	
		80,493 16 6
Amount transferred from reserve-fund		1,612 1 2
		£260,403 14 4

GEORGE B. JACKSON, Superintendent.

[APPENDIX A.]

Statement of the Lamp and Private Rental (including Meter-Rents) derived from Townships within and beyond the City respectively, for the Years 1878-79 *and* 1879-80.

	Half Year ending Dec. 25, 1878.		Half Year ending June 24, 1879.		Total for the Year 1878-9.	Half Year ending Dec. 25, 1879.		Half Year ending June 24, 1880.		Total for the Year 1879-80
Within the city—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Township of Manchester—										
Private rental	63227 17 4		71341 13 1			63738 15 9		71650 8 5		
Public lamps	4297 6 6		3898 5 8			5115 2 10		4745 11 8		
		67525 3 10		75239 18 9			68853 18 7		76396 0 1	
Other townships—										
Private rental	41718 12 4		47049 14 2			41240 8 6		45697 10 2		
Public lamps	3486 2 3		3526 3 6			3556 5 3		3589 4 9		
		45204 14 7		50575 17 8			44796 13 9		49286 14 11	
Total within the city		112729 18 5		125815 16 5	238545 14 10		113650 12 4		125682 15 0	239333 7 4
Beyond the city—										
Private rental	37812 1 6		43485 12 7			38593 12 10		44561 0 5		
Public lamps	3384 8 11		3493 10 6			3544 9 7		3617 0 9		
Total beyond the city		41196 10 5		46979 3 1	88175 13 6		42138 2 5		48178 1 2	9:316 3 7
Total		153926 8 10		172794 19 6	326721 8 4		155788 14 9		173860 16 2	329649 10 11
Deduct lamps, portion of year not charged					7382 9 8			Deduct gas supplied to city lamps not charged		10917 6 8
Gross rental					319338 18 8					312732 4 3

Within the city: Gross rental (1878-79) £231,163 5s. 2d.; ditto (1879-80) £222,416 0s. 8d.; decrease, £8747 4s. 6d. Beyond the city: Gross rental (1878-79) £88,175 13s. 6d.; ditto (1879-80) £90,316 3s. 7d.; increase, £2140 10s. 1d. Total: Gross rental (1878-79) £319,338 18s. 8d.; ditto (1879-80) £312,732 4s. 3d.; decrease, £6606 14s. 5d.

[APPENDIX B.]

Comparative Statement of the Gas transmitted from the Works, in the Daytime and during the Twenty-four Hours, for the Years 1878-79 *and* 1879-80.

	Daytime.				Twenty-four Hours.			
	1878-79.	1879-80.	Increase.	Decrease.	1878-79.	1879-80.	Increase.	Decrease.
	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.
July	27,103,000	32,506,000	19·93	....	102,600,000	113,985,000	11·1	....
August	26,718,000	26,311,000	....	1·52	115,779,000	115,823,000	0·04	....
September	27,444,000	29,875,000	8·86	....	142,422,000	145,906,000	2·45	....
October	37,090,000	48,622,000	31·09	....	209,901,000	229,530,000	9·35	....
November	58,964,000	51,387,000	....	12·85	274,759,000	264,668,000	....	3·67
December	82,065,000	76,312,000	....	7·01	325,525,000	326,393,000	0·27	....
January	72,076,000	74,351,000	3·16	....	319,726,000	322,075,000	0·73	....
February	60,579,000	49,970,000	....	17·51	262,150,000	257,143,000	....	1·91
March	48,603,000	41,617,000	....	14·37	215,687,000	200,916,000	....	6·85
April	58,095,000	54,597,000	....	9·18	150,650,000	148,848,000	....	1·2
May	32,828,000	27,799,000	....	15·32	122,471,000	119,573,000	....	2·37
June	20,540,000	22,891,000	11·44	....	73,300,000	78,901,000	7·64	....
Total	532,105,000	516,238,000	....	2·98	2,314,970,000	2,323,761,000	0·38	....

During the daytime (1878-79), 532,105,000 cubic feet; (1879-80) 516,238,000 cubic feet; decrease, 15,867,000 cubic feet. During the twenty-four hours (1878-79), 2,314,970,000 cubic feet; (1879-80) 2,323,761,000 cubic feet; increase, 8,791,000 cubic feet.

[APPENDIX C.]

Table showing the Number of each Size of Meters in Use on June 24, 1879 *and* 1880, *respectively.*

Size of Meters.	Townships within the City.														Townships beyond the City.		Total.		Increase.	Decrease.
	Manchester.		Chorlton-on-Medlock.		Hulme.		Ardwick.		Beswick.		Cheetham.		Total within the City.							
	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.	1879.	1880.		
1 light	14	10	1	..	7	2	1	2	..	..	..	..	23	14	10	8	33	22	..	11
2 lights	9995	9265	3352	3156	6057	5710	2441	2366	585	578	1230	1145	23660	22220	9810	9331	33470	31551	..	1919
3 ,,	4266	4277	2939	2968	2623	2596	847	840	167	185	1501	1515	12343	12381	6822	7169	19165	19550	385	..
5 ,,	2712	2719	1982	1975	894	884	424	407	60	68	1177	1229	7249	7282	4542	4767	11791	12049	258	..
10 ,,	1778	1815	655	722	290	307	158	172	22	23	335	363	3238	3402	1544	1774	4782	5176	394	..
15 ,,	2	1	..	..	..	..	..	..	..	..	2	2	4	3	..	..	4	3	..	1
20 ,,	1062	1068	184	193	117	121	64	62	4	6	68	76	1499	1526	458	501	1957	2027	70	..
30 ,,	485	490	47	50	40	38	19	21	6	6	37	37	634	642	174	174	808	816	8	..
40 ,,	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..
45 ,,	32	29	1	1	2	2	2	1	..	..	..	..	37	33	8	11	45	44	..	1
50 ,,	361	374	25	28	28	28	21	22	2	2	24	25	461	479	113	125	574	604	30	..
60 ,,	140	144	13	15	16	15	2	2	..	..	9	11	180	187	25	32	205	219	14	..
80 ,,	118	122	9	9	11	7	6	6	..	..	2	2	146	146	25	24	171	170	..	1
100 ,,	194	204	13	11	6	6	8	10	2	2	8	8	231	241	44	41	275	282	7	..
150 ,,	58	54	7	7	6	5	6	6	..	..	2	2	79	74	20	19	99	93	..	6
200 ,,	25	28	4	4	3	6	..	1	2	..	3	3	37	42	14	12	51	54	3	..
250 ,,	3	6	..	..	..	..	..	..	1	1	..	..	4	7	1	1	5	8	3	..
300 ,,	13	16	1	1	3	2	..	..	..	..	3	3	20	22	21	20	41	42	1	..
500 ,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	1	2	1	..
600 ,,	3	3	..	..	..	..	..	..	..	..	..	..	3	3	..	..	3	3	..	..
1000 ,,	1	1	..	..	..	..	..	..	..	..	..	..	1	1	1	1	2	2	..	..
Total	21262	20627	9233	9140	10103	9729	3999	3918	851	871	4401	4421	49849	48706	23633	24012	73482	72718	1175	1939

Total decrease, 1939. Deduct increase, 1175; net decrease, 764 meters.

[Appendix C—*continued.*]

Statement showing the Number and Size of Meters on Hire on June 24, 1880 (included in preceding Table).

	1 Light.	2 Lights.	3 Lights.	5 Lights.	10 Lights.	20 Lights.	30 Lights.	50 Lights.	60 Lights.	80 Lights.	100 Lights.	Total, 1880.	Total, 1879.	Increase. 1880.
Within the city	13	15487	9089	4499	1469	384	120	74	31	16	28	31210	30220	990
Beyond the city	5	4856	5646	3342	792	94	18	12	7	1	10	14783	13736	1047
Total	18	20343	14735	7841	2261	478	138	86	38	17	38	45993	43956	2037

[Appendix D.]

Gas-Mains Laid and Taken up during the Year ending June 24, 1880.

Laid.	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 12 in.	Diam. 14 in.	Diam. 15 in.	Diam. 16 in.	Diam. 17 in	Diam. 18 in.	Diam. 24 in.	Diam. 30 in.	Total Length.	Remarks.
Townships within the city—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	
Manchester	491	2471	607	..	1554	120	..	..	..	..	48	..	..	314	381	1195	7181	
Cheetham	257	564	278	..	134	..	..	..	..	..	..	..	..	..	..	..	1233	
Hulme	..	1107	..	..	..	..	..	..	..	..	..	..	..	..	23	..	1130	
Chorlton-on-Medlock	132	755	20	..	15	..	..	..	..	..	..	..	..	..	..	..	922	
Ardwick	17	312	270	..	30	..	..	..	11	..	..	..	..	..	..	..	649	
Beswick	..	151	..	..	..	..	..	..	..	..	..	..	..	..	..	..	151	
Townships within the city	897	5360	1175	..	1742	120	..	..	11	..	48	..	..	314	404	1195	11266	Yards laid— Within the city.
Townships beyond the city	1622	6999	2755	..	1191	1048	..	..	1356	37	680	61	33	1063	10	486	17341	Beyond the city.
Total	2519	12359	3930	..	2933	1168	..	..	1367	37	728	61	33	1377	414	1681	28607	During the year.
																		Being 16¼ miles and 7 yards.
Taken up.																		
Townships within the city	472	965	120	200	384	..	..	9	..	..	501	..	..	..	48	..	2699	Yards taken up— Within the city.
Townships beyond the city	571	698	1319	18	29	..	35	..	477	..	..	..	..	..	..	..	3147	Beyond the city.
Total.	1043	1663	1439	218	413	..	35	9	477	..	501	..	..	..	48	..	5846	During the year.
																		Being 3⅓ miles and 126 yards.
Laid during the year 1879–80	2519	12359	3930	..	2933	1168	..	..	1367	37	728	61	33	1377	414	1681	28607	
Taken up during the year 1879–80	1043	1663	1439	218	413	..	35	9	477	..	501	..	..	..	48	..	5846	

Net increase during the year ending June 24, 1880, 22,761 yards; being 12¾ miles and 321 yards.

Summary.

	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 7 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 11 in.	Diam. 12 in.	Diam. 13 in.	Diam. 14 in.	Diam. 15 in.	Diam. 16 in.	Diam. 17 in.	Diam. 18 in.	Diam. 20 in.	Diam. 22 in.	Diam. 24 in.	Diam. 30 in.	Total Length
Pipes laid to June 24, 1879—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Within the city	263402	130825	52313	14687	31677	738	15482	13455	1456	279	31086	309	7222	4770	3993	55	5755	324	477	7210	3743	589258
Beyond the city	161254	83177	58960	6594	33399	410	29000	13713	1327	1808	21470	..	749	341	..	..	5164	..	..	1105	3095	421566
	424656	214002	111273	21281	65076	1148	44482	27168	2783	2087	52556	309	7971	5111	3993	55	10919	324	477	8315	6838	1010824
Pipes laid during the year ending June 24, 1880—																						
Within the city	897	5360	1175	..	1742	..	120	..	..	..	11	..	..	48	..	..	314	..	..	404	1195	11266
Beyond the city	1622	6999	2755	..	1191	..	1048	..	..	..	1356	..	37	680	61	33	1063	..	..	10	486	17341
	427175	226361	115203	21281	68009	1148	45650	27168	2783	2087	53923	309	8008	5839	4054	88	12296	324	477	8729	8519	1039431
Deduct pipes taken up during year ending June 24, 1880.	1043	6613	1439	218	413	..	..	35	9	..	477	..	..	501	..	..	..	..	..	48	..	5846
Total	426132	224698	113764	21063	67596	1148	45650	27133	2774	2087	53446	309	8008	5338	4054	88	12296	324	477	8681	8519	1033585

Total, 1,033,585 yards; or 587¼ miles and 25 yards.

[Appendix E.]

Statement showing the Amount of Gross Profit, and the Mode of its Appropriation; also the Amount of Borrowed Money Owing, and the Excess of Assets, &c., from the Year 1862 to the present Date.

Year ending June 24.	Profits.	Maximum Price of Gas, per 1000 Feet, within the City.	Appropriation of Gas Profits. Interest.	Liquidation of Mortgage Debt.	Surplus.	Street Lighting, Gas not included.	Amount advanced to Improvement Committee in anticipation of Profits.	Paid over for Improvement Purposes.	Retained towards Repayment of Advances made to the Improvement Committee in anticipation of Profits.	Carried to Reserve-Fund to meet future Contingencies.	Balance owing of Amounts advanced in anticipation of Profits.	Borrowed Money Owing.	Amount charged to Revenue in respect of Depreciation of Works and Mains.	Excess of Assets.
	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1862	42667 7 1	4 0	19330 14 4	7854 9 7	....	....	7854 9 7	....	....	....	382539 7 10	12179 4 11	126591 4 6
1863	55804 12 9	4 0 / 3 9	14932 17 8	18609 17 4	22261 17 9	....	....	22261 17 9	....	....	....	362877 8 10	12666 18 11	145201 1 10
1864	59545 18 9	3 9 / 3 6	13388 12 10	17810 1 0	27847 4 11	....	....	27847 4 11	....	....	....	335808 16 9	12690 12 9	163011 2 10
1865	56432 4 5	3 6 / 3 2	13086 10 9	17587 0 11	25758 12 9	....	....	25758 12 9	....	....	....	306951 2 2	13050 6 6	180598 3 9
1866	52553 2 10	3 2	13252 13 0	19784 2 0	19516 7 10	....	....	19516 7 10	....	....	....	347472 2 11	13817 2 9	200382 5 9
1867	47323 0 4	3 2	14167 11 7	19898 0 4	13257 8 5	....	....	13257 8 5	....	....	....	331725 9 7	14628 8 6	220280 6 1
1868	49546 4 7	3 2	14314 17 9	20246 0 5	14985 6 5	....	13059 8 5	28044 14 10	....	....	....	351035 10 4	15173 2 5	239685 15 6
1869	52736 18 4	3 2	15467 12 6	22688 14 4	14580 11 6	....	11303 19 8	25884 11 2	....	....	24363 8 1	395469 8 5	15387 15 7	262374 9 10
1870	65343 10 8	3 2	16784 13 8	24487 6 0	24071 11 0	....	3750 0 0	27821 11 0	....	....	28113 8 1	432941 1 9	17633 5 10	286861 15 10
1871	79322 9 5	3 2	18329 0 5	27050 15 11	33942 13 1	....	....	28020 11 11	5922 1 2	....	22191 6 11	448593 9 5	19602 10 5	313912 11 9
1872	63257 9 7	3 2	18539 19 6	27805 15 11	16911 14 2	....	13293 10 3	30205 4 5	....	....	35484 17 2	459593 9 5	22283 6 8	341718 7 8
1873	63603 0 6	3 2 / 3 4	18413 7 1	28588 19 6	16600 13 11	....	16641 11 6	33242 5 5	....	....	52126 8 8	460640 11 0	22614 18 6	370307 7 2
1874	77465 12 2	3 4 / 3 8	18861 13 3	28977 9 6	29626 9 5	....	183 9 4	29809 18 9	....	....	52309 18 0	457834 5 0	22849 4 5	399284 16 8
1875	106807 6 5	3 8	17182 18 8	28514 17 11	61109 9 10	....	....	35257 2 1	23852 7 9	....	26457 10 3	432310 2 0	22908 7 0	427790 14 7
1876	101232 4 6	3 8 / 3 6	16185 10 8	28070 2 5	56976 11 5	....	Transferred from Reserve-Fund.	39410 17 0	17365 14 5	....	8891 15 10	405562 14 1	23491 15 7	455869 17 0
1877	100339 16 7	3 6 / 3 4	15518 2 1	27729 15 8	57291 18 10	....		42133 16 3	8891 15 10	6266 6 9	....	377359 2 6	24021 13 9	483599 12 8
1878	111594 3 4	3 4 / 3 0	15069 14 2	27408 18 7	69115 10 7	....	£ s. d.	51996 5 3	....	17119 5 4	....	457028 14 7	25194 19 6	511003 7 3
1879	95813 14 5	3 0	18084 19 5	28726 15 7	46000 3 5	2101 16 0	2998 0 7	52000 0 0	....	....	....	550580 9 6	25466 9 9	539735 6 10
1880	111013 1 11	3 0	24929 7 2	29246 14 1	50387 18 10	6449 1 10	1612 1 2	52000 0 0	....	....	....	538512 8 10	26771 15 2	568982 0 11
										23385 12 1				
								Less amount	transferred.	4610 1 9				
Tot.	1392601 18 7	..	312492 5 4	462562 1 9	608996 13 8	8550 17 10	4610 1 9	592322 19 4	....	18775 10 4	....	....	362431 18 11	..

THE TOWN OF LILLE IN DARKNESS.—On the evening of Monday last week the town of Lille was suddenly almost plunged in darkness by an accident at the gas-works, by which the pressure became insufficient to force the gas in the necessary quantity to a distance. Candles had to be lighted in the *cafés* and shops, and there was quite a run on the grocers for these useful household articles. About midnight the accident was repaired, and the streets resumed their usual appearance.

THE COSTS OF THE EXETER CORPORATION GAS BILL.—At the meeting of the Exeter Town Council on Wednesday last—the Mayor (Mr. W. H. Ellis) in the chair, Alderman Thomas moved, pursuant to notice—"That the resolution of the Council of the 28th of July, 1880, directing payment of the Parliamentary Agent's costs in relation to the Exeter Corporation Gas Bill, 1878, be rescinded." Alderman Daw seconded the motion. Mr Darke observed that £150 had already been paid on account of the bill, and he should be glad to know, if the rest of the bill was illegal, whether the sum paid on account was legal. The Town Clerk replied that the time for questioning that payment had gone by. Mr. Andrew apprehended that the Town Clerk had incurred the costs in obedience to the directions of the Council; and were they as a body to leave this matter on the shoulders of the Town Clerk and repudiate their own acts? He had no sympathy whatever with outsiders or insiders who, having given instructions to incur certain costs, repudiated their liability. Under the circumstances, he should be prepared to bear individually his part in the payment of these costs. The resolution of Alderman Thomas was caried.

NORTH OF ENGLAND GAS MANAGERS ASSOCIATION.

The Seventh Half-Yearly Meeting of this Association was held at Sunderland on Saturday, the 2nd inst.—Mr. J. H. Cox, President of the Association, in the chair.

The SECRETARY (Mr. W. Hardie) having read the notice convening the meeting, and the minutes of the last meeting having been confirmed, the following gentlemen were unanimously elected members of the Association:—

Mr. Robert Brass . . .	Gas Manager . . .	Tudhoe.
„ John M'Kenzie . .	„ . . .	Morpeth.

The undermentioned gentlemen were elected associates:—

Mr. H. B. Burrows	London.
„ R. B. Charlton	Newcastle.
„ J. R. Forster	„
„ G. H. Herbert	„
„ H. Tonkinson	Sunderland.

The PRESIDENT then delivered the following

INAUGURAL ADDRESS.

Gentlemen,—For the honour you have conferred upon me by electing me your President, and for having selected Sunderland as your place of meeting, I most cordially thank you. The continued success of the North of England Gas Managers Association is a subject for hearty congratulation, and it is to be hoped that before long every gas manager within the district will enrol himself as a member. Few professional men are so isolated from each other as gas managers; but these meetings bring them together, where they can compare notes, interchange ideas, and investigate discoveries as they may arise in the mechanical and chemical appliances of their business, and when each returns to his own particular sphere of action, it will be with his capability of usefulness increased, and his mind enriched by information gained from the experience of others. A generous emulation is by these means established, and it is whilst striving after skill and excellence in his profession that a manager is enabled most successfully to perform his duty to his directors and the public.

As showing the progress made by the gas companies in this neighbourhood, I may mention the opening of the new gas-works for the Bishop Auckland District Gas Company; also the new retort-house and other considerable extensions at the Hendon station of the Sunderland Gas Company; and last, though not least, the commencement of operations at the Jarrow station of the South Shields Gas Company, where may be seen in full operation the improvements in machinery and apparatus for charging and drawing retorts, the invention of our friend Mr. Warner. I am sure we all wish that the ingenuity and enterprise of that gentleman may be crowned with complete success.

The various exhibitions of gas apparatus in the large centres of the kingdom have done very much to popularize and increase the use of gas-cooking stoves and gas-engines, and there is an exhibition of apparatus for the utilization of gas, electricity, &c., being held in Glasgow, which, I understand, is well worthy of a visit from all directors, managers, and others interested in the economical application of gas.

Thanks to the scientific labours of Sugg, Bray, and others, improved methods of street illumination are being extensively adopted in crowded thoroughfares in many large towns, and no doubt the success which has already been obtained will cause a rapid development of the system. It is clearly proved that gas, when used in sufficient quantity, and consumed under proper conditions in suitable burners, can afford all the illumination which, under ordinary circumstances, it is necessary to have.

No prominent measure affecting gas companies has been brought before Parliament during the past session, if we except the Employers Liability Bill, which includes in its provisions gas companies as well as all other employers of labour. Gas managers are generally very careful to provide against the risk of loss of life or injury to their workmen, therefore it is not apprehended that the Act, if fairly carried out, will entail much expense upon the companies. The principal danger—one probably resulting more in annoyance than pecuniary responsibility—is that, on the occurrence of an accident, however apparent may be the cause, the party injured, instead of endeavouring to effect an amicable arrangement with his employer, may be induced, without proper notice, to commence litigation, by one of that class which has a representative in most large towns (Sunderland, I hope, excepted), to whom a bill of costs is of more importance than the interest of his client. Probably, in nine cases out of ten, a sufferer by an accident would receive a much larger net amount into his pocket if he left himself in the hands of a company, than if such payment had to be made in obedience to the verdict of a court of law. Gas managers and all in authority under them will, however, do well to study the Act, and take every precaution to prevent coming under the operation of its penal clauses.

As manufacturers whose staple raw material is dug out of the bowels of the earth, we are, under any circumstances, much interested in the production of coal and its producers; but on the present occasion, located in the heart of the northern coal-field, and within a few miles of the scene of the most disastrous colliery explosion of modern times, we cannot do less than record how deeply we deplore the melancholy loss of those 162 hardy sons of toil, who, at Seaham Pit, on the morning of the 8th ult.,

> "Hidden away from the merciful sun
> Met death and burial all in one,"

and offer our heartfelt sympathy to their bereaved and sorrowing relatives. Our admiration is excited by the acts of that brave party of explorers, who, ignoring all danger to themselves, boldly faced death in the hope of rescuing the entombed miners.

Looking at all the circumstances in our favour, and carefully and without prejudice discounting all that may be considered adverse, we cannot but arrive at the conclusion that there is a great future yet in store for gas enterprise. The ease with which gas is manipulated, its now almost universal use in private dwellings, its gradual adoption as a motive power and for cooking purposes, and its cheapness, are irresistible arguments in favour of this view of the case.

In conclusion, I beg to remind you that we are near classic ground. From the banks of our own river, the Wear, a short distance from this spot, was written one of the earliest appeals in favour of the consumption of gas, on account of its local interest and humour, and the celebrity of its author. I trust you will excuse its reproduction. On Dec. 21, 1821, Sydney Smith thus wrote to Lady Mary Bennet:—"From thence to Lambton—and here I ask what use of wealth so luxurious and delightful as to light your house with gas? What folly to have a diamond necklace and a Correggio, and not to light your house with gas? The splendour and glory of Lambton Hall makes all other houses mean. How pitiful to submit to a farthing candle existence when science puts such intense gratification within your reach. Dear lady, spend all your fortune in a gas apparatus. Better to eat dry bread by the splendour of gas than to dine on wild beef with wax candles, and so good-bye, dear lady." The enthusiasm which inspired the witty divine when he wrote the above has considerably subsided, but the sacrifices necessary to obtain what he so forcibly recommends have decreased in a still greater proportion.

Before resuming his seat, the PRESIDENT added that it had been suggested to him that as the Association were in a very good financial position, they should show their practical sympathy for the sufferers in the recent accident at Seaham, by giving a contribution to the relief-fund. This proposition quite accorded with his own feelings, and he had great pleasure in moving that the sum of ten guineas be given to the fund.

Mr. W. J. WARNER, in seconding the motion, said he was of opinion at first that gas companies, being largely connected with the Durham collieries in their business, should have substantially aided the relief-fund; but as he was the adviser of a Company, he felt bound to say that he was afraid that directors, in their corporate capacity, could not legally make any contributions to the fund.

The motion was carried unanimously.

Mr. J. T. JOLLIFFE (Sunderland) then read a paper on

THE UTILIZATION OF THE WASTE HEAT FROM THE RETORT FLUES, FOR THE GENERATION OF STEAM.

At one of the first meetings of this Association, Mr. Hepworth favoured us with a very valuable contribution to our proceedings, on preventible waste in gas-works. Although the subject of this paper is the generation of steam from the waste heat of retort-settings, I think you will agree with me that it belongs equally to the subject which was so ably treated by Mr. Hepworth, and which in these days of keen competition we are all so much interested in—viz., economy in working.

The subject, as you are well aware, is no new one, and so I am unable to lay claim to the origination of any startling innovation. I find that a paper on the same subject—"Economy in Raising Steam in Connection with Gas-Works"—was to have been read at the meeting of the British Association of Gas Managers last year, by Mr. F. M. Harris, of Falmouth; but unfortunately, for want of time, it was taken as read. This I personally very much regret, for possibly the discussion which would in all probability have arisen might have brought out some interesting information on the subject; at any rate, it would have enlightened us as to what extent this means of raising steam is carried. My reading of that paper in the Tranactions of the parent Association, if it did not suggest to me the idea, certainly revived one that had for some time lain dormant; and during the summer just passed, when something like a coke famine occurred in this immediate neighbourhood, a very good opportunity arose for giving the idea a practical trial.

Having obtained permission to see to what extent it was practicable, I furbished up an old Cornish boiler that was lying in my yard, and had it thoroughly examined and put in working order. The boiler was 12 ft. long and 4 ft. 6 in. in diameter, and, to take every possible precaution against mishap, it was fitted with two safety-valves, steam whistle to blow off at low water and high steam, two sets of gauge-cocks and glasses, and a Bourdon steam pressure-gauge. I decided on placing the boiler in one of the arches where ordinarily a setting of retorts would be. I fixed it on a mid-feather, and made the heat travel through the tube, round one side, under the bottom, and up the other side to the main flue. The waste heat was diverted from the main flue by the aid of dampers, and made to travel down through an opening in the top of the arch, the way stated—viz., through and round the boiler up again to the main flue. The steam-pipe from the boiler was carried by a 6-inch pipe a distance of some 250 feet to the engine. The steam-pipe was coated for part of the distance with a material with the composition of which I am not acquainted, but which was a moderately good non-conductor, and part of the way with ordinary fire-clay mixed with hair, which was not so good; the temperature of the outside of the steam-pipe where coated with the composition ranging from 30° to 35° Fahr. above the atmosphere, and where coated with fire-clay it was considerably more.

Everything being in readiness, I diverted the waste heat from one through setting of 7 retorts, and in course of six hours had the satisfaction of seeing a pressure of steam upon the gauge. The steam raised by the waste heat from one setting was not sufficient, so I added the waste heat from another bed, and was soon able to raise steam enough to drive my pumping-engine. This was equivalent to a saving of from 10 to 12 cwt. of coke per day. Fully satisfied with the success so far, but still not accomplishing all I desired, I added the waste heat from another bed of retorts, and had the satisfaction of being able to drive my exhauster-engine in addition to the pumping-engine. This, it must be understood, was during the summer, and with the make of gas at its minimum.

It is here that I have to recount an element of failure. I found that, although getting all the steam I needed, the tortuous course through which the waste vapour was being carried interfered with the draught necessary for the retort-settings. To remedy this I removed the division in the brickwork at the end of the boiler, and allowed the heat to pass through the tube or round the sides. This completely cured the evil, and for some short time sufficient steam was raised to do all the work; but as the season advanced, and the work increased, I found the boiler was not sufficiently large—a result not at all unexpected when the size of the boiler is considered—and so was obliged to content myself with using it as an auxiliary.

Having shown that it is possible to raise steam for all purposes in the manner indicated, perhaps you will bear with me while I state the probable saving by the adoption of that method.

In a paper read by Mr. Corbet Woodall before the parent Association, in 1877, on the cost of exhausting gas, Mr. Woodall showed as the result of his experiments that with a non-conducting engine driving a Beale's exhauster, coupled direct, it required 2 lbs. of coke to raise sufficient steam to exhaust 1000 cubic feet of gas against the pressure of a column of water 36 inches high, and that the expenditure of fuel bore a direct proportion to the pressure. With a view to ascertain how near I was working to the standard, I made a series of careful observations, extending over several days. The coke was carefully weighed into the boiler-house day by day, and the make of gas duly noted. The average consumption of fuel was found to be 4·10 lbs. per 1000 cubic feet, against a pressure of 20 inches. I was not quite sure what gave rise to this extraordinary consumption, but imagined that it arose from the exhauster having so little work to do—about one-fourth its actual power. I resolved to watch carefully and to take note, as the make of gas increased, how the consumption of fuel was affected, and I found that my surmise was correct, for as the exhauster became more fully employed the consumption of fuel decreased until it became 2·18 lbs. per 1000 feet of gas. This fully bears out Mr. Woodall's experience that 2 lbs. of coke per 1000 feet of gas will raise, with a Cornish boiler, sufficient steam to work one of Beale's exhausters, when driven by a non-condensing engine, coupled direct.

I will assume, therefore, that 2 lbs. of coke will generate sufficient steam to exhaust 1000 feet of gas—although in actual practice it will be found considerably more, owing to the varying speed at which the exhauster has to travel to adapt it to the requirements of the season—and another 1 lb. of coke is needed to raise sufficient steam to work the tar, liquor, and water pumps, and the numberless other purposes for which steam is in general use in all gas-works. Each ton of coal will produce 10,000 feet of gas and about 1500 lbs. of coke; so that to exhaust the gas produced from each ton of coal, and work the necessary tar and liquor pumps, &c.,

needs an expenditure of 30 lbs. of coke, or about 2 per cent. of the total quantity produced. To those who, like myself, have to manufacture sulphate of ammonia by the aid of steam, the saving will be considerably more. I find that for each pound of sulphate produced, something like 2 lbs. of coke is needed, and taking the yield of sulphate at 18 lbs. per ton of coal, we have 36 lbs. of coke used as fuel, which added to the 30 lbs. already used for exhausting gas, &c., brings the total quantity to 66 lbs., or about 4·5 per cent., and this I am convinced is not at all an excessive estimate.

Whether the class of boiler I have is the best that might be used for the purpose, I am unable to say. As I have already stated, it was one that was lying useless, or apparently so, in my yard, and it was with it I decided to experiment. Mr. Harris in his paper, gives it as his opinion that the plain cylindrical boiler is the best. I rather incline to the Cornish, with the addition of Galloway tubes, care being taken that the area of the tube or tubes is in excess of the area of the retort-flues. Neither am I prepared to say that the position I have chosen for the boiler is the best. Mr. Harris has his fixed on a flue parallel to the main flue, and next the chimney. This position, in my case, was impossible. I have through settings, and the inaccessibility of a boiler so placed would be a fatal objection.

Since writing the above, I have added another boiler similar in size to the one already in use. This addition necessitated altering the position of the boiler. The arch in which the first one was set is not sufficiently large to accommodate both, and as I did not feel justified in taking up more room in the retort-house, I have set the two side by side on the retort-beds, in the way indicated by Mr. Harris, in his paper, only at the end of the house instead of near the chimney. With this addition I am enabled to raise nearly sufficient steam for my present wants.

In conclusion, I trust that the few facts I have laid before you are not altogether devoid of interest, and that they contain matter of some moment to us all. In drawing your attention to the immense amount of heat going to waste from our retort-flues, I have endeavoured to show a means whereby part of it may be utilized, and thus we may be enabled to keep on towards that end for which we all so earnestly strive—viz., lessened cost of production.

Discussion.

Mr. W. Ford (Stockton-on-Tees) said he was sure they had all listened with great pleasure to Mr. Jolliffe's paper, and would be glad to hear, at some future meeting, of the success of his scheme. The only obstacle he had found to the utilization of the heat had been the interruption to the heat of the furnace. If the method was injurious to the generation of gas in the retorts, the economy would cease, but if Mr. Jolliffe was able to affirm that it had not this effect, he was sure he deserved their warm thanks for the paper he had read.

Mr. V. Wyatt (London) said every one must be struck by the immense waste of heat passing the retort flues, causing thousands of tons of coal to be consumed without any motive power resulting. When man could hit upon a method by which a perfect utilization of this waste heat could be secured, the result would be to put gas-works in so economical a position that companies would be able to produce and sell their gas cheaper than they were now doing. The saving would of itself in some cases amount to a dividend.

Mr. J. A. G. Ross (Newcastle-on-Tyne) said he thought Mr. Jolliffe had hit upon the right kind of boiler to be used—the Cornish one. He thought, too, he had tapped a seam which, if properly worked, might revolutionize gas manufacture in this country.

Mr. Jolliffe briefly thanked the various speakers for the complimentary manner in which they had alluded to his paper.

(To be continued.)

WEST OF SCOTLAND ASSOCIATION OF GAS MANAGERS.

As briefly announced in our "Trade Notes from Scotland" last week, the Seventeenth Half-Yearly Meeting of this Association was held on Friday, the 1st inst., at Port Glasgow—Mr. R. S. Carlow, the Manager of the Port Glasgow Gas-Works, in the chair.

After the transaction of some formal business, Messrs. Alex. Ross, of Burntisland, and Alex. Waddell, of Kirkfieldbank, were admitted members of the Association.

The President, in his inaugural address, gave a brief historical account of the town in which the Association had assembled, and thereafter he dwelt upon the necessity of economy in the retort-house. He discussed the question of mechanical stokers *versus* hand labour, and argued at some length that the machines must be simpler in construction and more readily applied to existing settings of retorts before they could be generally adopted. He also contrasted the question of gas lighting as against electricity, and pointed out that while the latter method might eventually come to be applied to large spaces, it would not, so far as they could at present see, successfully compete with gas. He thought, further, that if gas companies would only encourage the consumption of gas during the hours of daylight, not only would gas-works be employed during hours when they are at present idle, but their employment would do much to enable companies to reduce the price of gas.

Mr. Brown (New Cumnock), in moving a vote of thanks to Mr. Carlow, said it was the duty of gas managers to do all in their power to get the inhabitants of their respective towns to visit the exhibition of gas apparatus being held in Glasgow, as in doing this they would be forwarding the interests of their profession.

Mr. Robert Mitchell (Coatbridge) read a paper on the valuation of gas-works, in the course of which he pointed out the absence of similarity in the valuation of works, and argued that a general rule ought to be laid down so that one works should not be rated higher than another. Mr. D. Jeffrey (Kirkintilloch) suggested that gas companies should join together and raise the question in the Supreme Court, in order that a decision of the point at issue might be obtained. Mr. S. Dalziel (Kilmarnock) then read a paper on the treatment of residual products. He showed that gas-works, by erecting the necessary chemical plant for the treatment of the products of distillation, could in a very few years realize a handsome profit. Mr. D. Bruce Peebles (Edinburgh) read a paper upon, and described his new system for ascertaining the consumption of gas in street-lamps; and Mr. J. M'Gilchrist (Dumbarton) explained his improved photometer meter disc.

The above-mentioned papers, with the discussions which followed their reading, we shall publish as usual in the Journal.

In the evening the members of the Association dined at the Star Hotel, where Mr. Carlow presided, and Mr. Dalziel discharged the duties of croupier.

The Water Supply of Church Coppenhall, Cheshire.—It is stated that a serious outbreak of fever has occurred at the above-named place, attributed to the drinking of foul water; and the extraordinary statement is made that, though the Sanitary Committee of the Nantwich Union have put down pipes by which a supply of pure water is brought into the village from Crewe, many of the landlords and tenants have refused to have the water laid on.

WALSALL CORPORATION GAS SUPPLY.

At the Meeting of the Walsall Town Council on Monday, the 4th inst., the Mayor, who occupied the chair, proposed that, pursuant to a recommendation of the General Purposes Committee, the sum of £7000 should be transferred from the accumulated profits of the gas undertaking to the borough fund, and that the Council should direct that no borough rate be made this year.

Alderman Brewer having seconded the motion,

The Town Clerk, in reply to a question as to what sum was wanted for the borough rate, said that last year it was 7d. in the pound; but it would have been 1s. 3d. in the pound if it had not been for £4000 transferred from the gas-works profits. The Council would therefore be foregoing, not merely a sevenpenny one, but a fifteenpenny one, if it was decided to give up the entire rate. This would extend to February next, when the Committee recommended that the whole question should be reconsidered, so as to decide whether that quarter should also be free. In reply to a further inquiry, he added that the profit last year was £4000. The £7000 was the estimated result at the end of the year, as during November and December a large floating balance—from £8000 to £10,000—would be required, but afterwards it would be less. There was no doubt of the £4000 profit.

Alderman Brownhill (Chairman of the Gas Committee), in reference to a question as to the extra 6d. per 1000 feet charged at Bloxwich, said that this extra amount only produced about £500; while the district over which it was charged got back one-third of the £7000. He thought that £2350 was a pretty good return for the extra 6d. It might seem like a joke, but it was certainly true. Bloxwich had the benefit of one-third of the £7000, and only paid for 11 million feet of gas. In fact Bloxwich paid one-eleventh of the amount received from the sale of gas, and got back one-third of the profit made.

The resolution was then put and carried unanimously.

THE GAS AND WATER SUPPLY OF GOOLE.

On the afternoon of Friday, the 1st inst., a Special Meeting of the Goole Local Board was held for the purpose of again considering the gas, water, and sewers question, and for discussing the result of the interview with Mr. Bartholomew, Engineer of the Aire and Calder Navigation Company, and the Board's Parliamentary Agent. The Rev. Dr. Bell presided.

The Clerk commenced the proceedings by reading a report of the interview referred to, in the course of which it was stated that the Committee charged with the business were convinced "that the Aire and Calder Navigation Company had no selfish wish to part with their gas-works, because they were increasing in value every year, and were one of their most profitable sources of income; but they did not hide from themselves the responsibility that attached to them in relation to the moral and physical welfare of the inhabitants of Goole, and were, therefore, most anxious to further a scheme for the supply of a sufficient amount of good and wholesome water for their use. Knowing that this could not be effected without a large outlay of money, and that it would embarrass the ratepayers to do so, it struck them that if they could transfer to a Company in which the Local Board could have an interest to the amount of a third portion of the shares, this would materially help them to make their annual payment of borrowed money, and require them to borrow a much less sum." The report concluded by saying that the Committee were authorized to state that the Aire and Calder Company would not accept less than the amount named for the works.

A statement of the financial results of the gas supply was also produced, from which it appeared that the profits of the past three years, 1877-79, were £1810 3s. 8d., £1954 0s. 2d., £1932 12s. 10d.; or an average of £1899 2s. 2d.

Seventeen years purchase of this would amount to	£32,283
To this must be added the capital expended in 1879 . . .	2,361
	£34,644
Add for extra land for Bridge Street gasholder, 7726 yards at 5s.	1,931
	£36,575
Deduct overcharge in account for Navigation Company's lamps	2,337
	£34,238

Seventeen years purchase is equivalent to 6½ per cent.

The Chairman read the following extract from a letter addressed to him by Mr. Bartholomew after a meeting of the Navigation Company the previous evening:—

The Navigation had under their consideration last evening the question of the price fixed for the gas-works in connection with their three proposals to the Goole Local Board, and I am desired to say that they have carefully considered the views held by the Board, and the arguments which you have from time to time so urgently made on their behalf, and whilst they feel the offer made—viz., £34,238—is a fair and liberal one, yet having regard to the feelings of yourself and the Board, and the well-being of the town and port, they are willing that the sum to be inserted in the arrangements for the gas-works should be £33,000 exclusive of stores—coal, coke, gas water, tar, or refining materials in stock at the time of transfer—which must be taken over at cost and contract delivered price.

In conclusion, I am to add that, the time for preparing a Bill for introduction next session being so short, this final proposal of the Navigation can only be left open for the Board's acceptance until the 13th inst.

The Chairman, after much talk on the matter, proposed, and Mr. Bennett seconded, the following resolution:—"That after hearing the report of the interview and the Company's letter of this day, the Board are prepared to purchase by valuation in the usual way, but not at a sum fixed by the Company; and subject to the heads of arrangement of the scheme for gas, &c., works being approved by the Local Government Board and Parliament."

Mr. Couse submitted the following amendment—"That as the price fixed by the Company is too high, and they decline to go to arbitration, the Board declines the Company's offer."

The amendment was seconded by Mr. Hickman; but after some further remarks, during which Mr. Couse refused, at the request of the Chairman, to withdraw his amendment, the motions were put, and the one by the Chairman was carried.

On Tuesday last, at the Ordinary Meeting of the Board, the Clerk read the following letter from Mr. Bartholomew with regard to the resolution given above:—

Leeds, Oct. 4, 1880.

G. England, jun., Esq., Clerk to the Goole Local Board.

Dear Sir,—I have to acknowledge receipt of yours of the 1st inst., enclosing copy of a resolution of the Goole Local Board, conveying the decision of that body, on Friday last, in regard to the several proposals of the Navigation.

Were the questions involved ordinary ones, the Navigation would accept the decision of the Board as final, but inasmuch as the health and material prosperity of the inhabitants so largely depend upon a solution of the point in difference, the Navigation are induced to make the following observations and suggestions for the consideration of your Board.

Whilst the Navigation cannot now submit the price to be paid for the gas-works to arbitration, having already offered them to the Board at a price considerably below their

market value, which offer would obviously be used to their prejudice and made the starting point in any arbitration, looking also to the cost of such a reference, and for other reasons, they, as an alternative, have to suggest, as a satisfactory course open for the Board to adopt, to call in the advice of some experienced and qualified person to look over the works, and advise them as to their state of repair and selling value as a going concern, having regard also to the profits they have annually yielded, and the circumstances under which those profits have been made. I may add the Navigation would afford every information and opportunity necessary for the purpose. Should, however, the Board deem no other course open to them than that conveyed in their resolution referred to, I must ask you to consider and treat the whole of the proposals of the Navigation as withdrawn. (Signed) W. H. Bartholomew.

The Chairman suggested that there should be a special meeting of the Board called to consider the matter, and this was agreed to.

EXETER CORPORATION WATER SUPPLY.

The Water Accounts.

At the Meeting of the Exeter Town Council (sitting as the Urban Sanitary Authority) on the 29th ult.—the Mayor (Mr. W. H. Ellis) in the chair—a report was presented from the Water Committee, consisting of analyses of the two years water accounts to Lady-day last.

The account for the year ending Lady-day, 1879, showed that the total receipts up to that date were £9166 7s. 3d., which after meeting the payments left a balance of £369 13s. 5d. The principal payments were—Balance at Lady-day, 1879, £583 16s. 11d.; rates and taxes, £921 3s. 1d.; salaries, £698 15s. 5d.; wages, £1411 15s. 7d.; rent of offices, &c., £128 7s. 11d.; coal, £308 13s. 4d.; ironwork and repairs of engines, £259 6s. 11d.; iron pipes, £861 3s. 9d.; incidental repairs, £291 2s. 2d.; incidental expenses, £106 9s. 6d.; interest on debentures, £522 4s. 9d.; annuities, £316 5s. 1d.; Urban Sanitary Authority, £2335 1s. 8d. The assets were put down as cash balance, £369 13s. 5d.; arrears of water-rents, less bad debts and allowed on appeal—£765 16s. 9d; arrears of land rent, £10 7s. 1d.; due from Sanitary Authority on account of fire hydrants, £17 15s. 6d.; paid to the Exeter Water Company for costs connected with the sale of their undertaking to the Corporation, to be repaid out of capital, £296 19s. 8d.; stock on hand, £2367 14s. 9d.—total, £3828 7s. 2d. The liabilities set down on account of rates, taxes, salaries, coal, iron pipes, &c., amounted to £827 3s. 11d.; of which sum £167 13s. 2d. was in respect of salaries. There was due to the Urban Sanitary Authority in respect of interest, £2336 14s. 6d.; interest on outstanding debentures, £116 9s. 1d.; six months annuities, £171 7s. 1d.; leaving a balance of £376 12s. 7d. The draft capital account showed on one side the amount borrowed on mortgages under the Act of 1878, £120,000; balance, £5868 2s. 9d.—total, £125,868 2s. 9d. The other side the account showed the following items:—Late Exeter Water Company's share capital, £94,000; do., debentures, £16,000; do., Lloyd's bonds, £5419; do., stock and moveable plant, £997 18s. 6d.; do., costs connected with sale to the Corporation, £296 19s. 8d.; late Dartmoor Water Company, £2038; cost of Act of Parliament, £844 18s. 8d.; stamp on transfer deed, £582 5s.; stamps on mortgages, £150; brokers commission, £600; additional stock and moveable plant (being the difference between the Surveyor's valuation at Lady-day, 1880, £2367 14s. 9d., and the amount paid to the late Company, £997 18s. 6d.), £1369 16s. 3d.; ironwork and repairs paid in the year ending Lady-day, 1879, £1169 4s. 8d.; filter-beds (first portion) paid in the year ending Lady-day, 1880, £600; estimated further outlay on account of filter-beds, £1800—total, £125,868 2s. 9d. It was resolved by the City Water Committee that it be reported to the Council that since the transfer of the water undertaking to the Corporation the Committee had expended out of income the following sums, viz.:—Additional stock and moveable plant, £1369 16s. 3d.; ironwork and repairs paid in the year ending Lady-day, 1879, £1169 4s. 8d.; paid on account of reconstruction of filter-beds (the estimated cost of which was £2400), £600—total, £3139 0s. 11d., which sums they were of opinion should more properly be charged to capital, and inasmuch as the full capital of £120,000 authorized to be raised by the Exeter Corporation Water Act, 1878, had been raised and appropriated, as appeared by the capital account presented to the Council, and the stamp duty of £150 on the mortgages, and the brokers commission of £600 on the loan which had been paid out of the district fund were also capital payments, the Committee recommended that the Council should make application to the Local Government Board for leave to borrow £6000. The Chairman of the Committee also presented the following estimate of receipts and expenditure for the current year from Lady-day, 1880, viz.:—Income, £9400; working expenses (including interest on £120,000 original capital, and £6000 proposed new capital), £8770; sinking-fund, £445—total expense, £9215, leaving an estimated surplus of £185. It was resolved that the Council be requested to authorize the bankers to permit the City Treasurer to overdraw the water account for the purpose of discharging the debt due to the Urban Sanitary Authority for interest on the Exeter Corporation water loan.

Alderman Richards moved the adoption of the several reports.

Alderman Hughes seconded the motion, which, after considerable discussion, was agreed to.

Alderman Richards next moved that the Water Committee's recommendation that the Council should borrow £6000 on account of the water undertaking be adopted. He said that the Committee found there was not sufficient capital, and had expended £5868 2s. 9d. beyond the original amount. If they had not paid this out of their income for the time being, there would have been a profit on the year of £1332 5s. 3d. But it would be well to know that this would not be continued in the future, for the income on the new water-rate would be diminished by about £600. By charging only 5 per cent. on the net rateable value, the Committee calculated they lost £800 a year, and also £200 by giving up the charge on gardens. To some extent this was made up by other persons taking the water, and the income it was estimated would be but £600 a year less than when the Council commenced supplying water. He still thought that they would have a surplus, though not a large one. According to the Surveyor's account the estimated income was £9400; working expenses, including interest on original and proposed new capital, £8770; sinking-fund, £445—total, £9215; leaving a surplus of £184. The £13,000 profit made during the first two years would be available if the Council sanctioned the borrowing of the additional capital of £6000, and with the money they would ask to be allowed to make a new intake, which had been recommended by the City Surveyor. It was also proposed to erect new filter-beds. He hoped the Council would see the necessity of allowing them to put the income and capital accounts right by asking for this £6000.

Alderman Hughes seconded the motion, which was put and carried, and the Council proceeded with the next business.

Reduction in the Price of Gas at Pontefract.—The Directors of the Pontefract Gas Company have determined on reducing the price of gas 3d. per 1000 cubic feet from the 1st of January next.

Sale of Shares in the Ossett Gas Company.—On Friday last Messrs. T. Booth and Son offered for sale in Wakefield 25 fully-paid £5 shares in the above Company, entitled to a dividend of 10 per cent., and 56 other shares bearing a dividend of 7 per cent. The 10 per cent. shares were sold at £12 5s. each, and the 7 per cents. at £8 7s. 6d. and £8 6s. each.

CURRENT SALES OF GAS PRODUCTS.

(BY A MANCHESTER CORRESPONDENT.)

In the Manchester chemical market coal tar has been selling freely during the past week at 38s. per ton for town contracts, and 30s. to 34s. per ton for small country contracts. Ammoniacal liquor has also met a ready sale at 22s. to 24s. per ton for sp. gr. 1·035, lower strength proportionately down to 18s. Ammonia sulphate in good demand at £19 10s. for white, and £18 5s. for grey. Ammonia chloride, white, £35, and ditto grey, £29. Brown vitriol, 58s.; muriatic acid, delivered, 27s. to 30s. No transactions in iron oxide or sulphur oxide.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Glasgow Exhibition of Lighting and Heating Apparatus, &c., is now becoming eminently popular, and is universally acknowledged as being an extraordinary success, alike as to the extent and variety, as well as the scientific and practical character of the exhibits at the various stands. During each evening of the past week the attendance of visitors was constantly on the increase. On Friday evening, in addition to the season ticket holders, there were upwards of 1000 persons admitted to the exhibition, and on Saturday the attendance was greater than on any previous day, fully 1200 persons having passed the turnstiles after six o'clock in the evening, without counting the attendants, exhibitors, and holders of season-tickets. The first of the special series of lectures organized by the Executive Committee of the Exhibition was delivered on Friday evening by Mr. A. Vernon Harcourt, F.R.S., one of the Metropolitan Gas Referees, his subject being "Domestic Gas Lighting." It was very fully illustrated by apparatus from the exhibition, and was an exceedingly interesting discourse. [In our next issue we hope to give a summary of Mr. Harcourt's lecture.—Ed. J. G. L.] The Committee have classified the exhibits with the view of having adjudications and reports upon the various groups of apparatus, &c., and have told off a number of small committees of experts as jurors, most of whom will doubtless be at work in a few days. The resolution to have exhaustive tests carried out in connection with the exhibition has excited a great deal of interest amongst the exhibitors. I may mention that in addition to the lectures arranged for some time ago—five in number—another has been resolved upon, the lecturer being Mr. James N. Shoolbred, M. Inst. C.E., London, the subject of the lecture being "Lighting and the Transmission of Power by Electricity." During the ensuing week there are to be bowling and football matches by the electric light.

On Thursday week the Gas Committee of the Glasgow Corporation Gas Commissioners finally selected for the vacancy in the managership of the Dawsholm Gas-Works, Maryhill, Mr. Robert Mitchell, of Coatbridge; and at the Town Council meeting held last Thursday the selection was confirmed without dissent. Mr. Mitchell, who is still a young man, has rapidly shot into a leading position in the gas profession in Scotland. A very few years ago he was assistant to his uncle, Mr. David Hunter, Manager at the Phœnix Gaslight and Coke Company's works, Greenwich; subsequently he was Assistant to Mr. William Young, of the Clippens Oil Works; and since then he has had the sole management of the works of the Coatbridge Gas Company. It may be remembered that he has passed the presidential chair of the West of Scotland Association of Gas Managers. There were 59 applicants for the position; and the "short list" included many well-known Gas Managers, amongst whom were Messrs. James M'Gilchrist, of Dumbarton, and David Terrace, of Arbroath.

At this stage another appointment may be mentioned. I refer to the choice of Mr. George Keillor, at present foreman under Mr. Terrace at the Arbroath Corporation Gas-Works, to the managership of the works of the Nairn Gas Company.

At a recent meeting of the Directors of the Falkirk Joint-Stock Gas Company it was resolved that at the commencement of the forthcoming meter survey the price of gas should be reduced to 4s. 2d. per 1000 cubic feet, being 5d. per 1000 feet lower than the price proposed by the Falkirk Lighting Company, Limited.

The twenty-fourth annual meeting of the Newport Gaslight Company was held on Saturday week, when a dividend of 7½ per cent. on the past year's transactions was declared.

The annual general business meeting of the Turriff Gas Company was held last Wednesday—Mr. Hutcheon presiding. A favourable report was laid before the meeting by the Manager, prominent notice being taken of the completion of the contracts for the execution of certain additions and extensions in connection with the works and plant. A dividend of 5 per cent. was declared, and a hope was expressed that at no distant date it would be safe and practicable to make a reduction in the price of gas. Mr. Alexander was re-appointed Manager, and the Directors were also re-elected.

The Glasgow pig iron market showed an improved condition in the latter half of the past week. As high as 50s. 9d. cash was paid on Thursday, but the top price on Friday was 50s. 4d. cash, and the close in the afternoon was 50s. cash for buyers and 50s. 2d. one month, sellers asking 1d. more per ton.

An improved tone is reported in regard to the coal trade, the demand being decidedly better.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

There is very little improvement to notice in the coal trade of this district. For shipment a moderately good business is being done, and a fair quantity of gas and steam coal is being sent away from both Liverpool and Garston; but in the home trade any increased demand is confined entirely to ordinary classes of fuel, and most of the Lancashire collieries are still working short time. But the present month has not opened so briskly as had been anticipated, and the little extra pressure which in some cases was experienced towards the close of September seems to have fallen off now that buyers find there is no material advance in prices beyond the slight upward movement which has been carried out by the leading firms in the Manchester district.

Common round coals for steam and iron-making purposes move off but slowly, and there is not much prospect at present of any increased demand from works in this district. Engine classes of fuel are beginning to feel the effects of the increased production of slack caused by the improvement in the house coal trade, and although there is not as yet any material giving way in prices, the tendency is towards less firmness. The average quotations at the pit mouth are about as under:—Best Wigan Arley, 7s. 9d. to 8s. 6d.; good ordinary qualities, 7s. to 7s. 6d.; inferior sorts, 6s. to 6s. 6d.; good Pemberton four-feet, 6s. 3d. to 6s. 9d.; Common Wigan mines, 4s. 9d. to 5s. 6d.; burgy, 3s. 9d. to 4s. 3d.; good slack, 3s. to 3s. 6d.; and common, 2s. 6d. to 3s. per ton. There is a good deal of low selling in the market, and for shipping orders very low figures are taken, steam coal being delivered at either Liverpool or Garston at 6s. to 6s. 6d. per ton. Shipments of Wigan gas coal are being made at prices which leave about 7s. per ton at the pit.

In the iron trade there is a complete lull, and prices are lower. For pig iron there is little or no demand, and local makers are now quoting

46s. 6d. to 47s. 6d. per ton, less 2½ for delivery equal to Manchester; but Lincolnshire and Derbyshire iron are to be bought at 1s. to 2s. per ton under these figures. Finished iron is moderately steady, but there are very few new orders coming in, and makers would take prompt specifications at under present rates. For delivery into the Manchester district bars are to be bought at from £5 17s. 6d. to £6 per ton.

THE SOUTH STAFFORDSHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

Quotably no alteration in the price of coal has been made in this district, though it was expected at the recent meeting that some alteration would take place. The demand is said to be slightly improving for several qualities. Nevertheless there are a large number of pits at which not more than a quarter of the quantity which might be raised is now being drawn. Stocks on the pits banks, too, in many parts of the district are unusually large. Furnace fuel is still in good request, the prices ruling are, however, extremely low. At several pits where the operations have been suspended for some months the water has so risen as to preclude any renewal of mining until an expensive course of pumping has taken place. At a meeting of the Mines Drainage Commissioners, held on Wednesday last, the Chairman referred to three pits into which water had run to such an extent that it would cost £2000 a year to pump it out again. It is estimated that in the Tipton district alone the cost of pumping for the current year will exceed £17,000. To the number of unworked pits there will doubtless be additions unless a greater improvement in the demand speedily takes place.

The iron trade is reported less active. At the meeting held at Wolverhampton, on Wednesday, and at Birmingham, on Thursday, there were good attendances; but business was dull. The chief feature of the week has been a decided drop in the price of marked bars, which now leaves them at £7 10s., excepting the [illegible] of the Earl of Dudley, which are now £8 2s. 6d. The new rates come into existence at once. The price of 24-gauge sheets will be £9; 26-gauge, £10; and 28-gauge, £11. The pig trade is dull, but it is understood that several buyers who have been withholding orders are now willing to complete contracts. Girders and other classes of manufactured iron are more inquired after than has been the case during the past few weeks. Iron-stone is in slow request, and but little Middlesbrough iron is in the market.

THE YORKSHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The position of the coal trade throughout Yorkshire was scarcely ever in a more critical state, the South Yorkshire district in particular bearing evidence on every hand of the ruinous state of trade. On Friday official advertisements were issued, stating that a petition for the winding up of the Silkstone and Dodworth Coal and Iron Company, Limited, had been presented to the Chancery Division of the High Court of Justice by Mr. Henry Smith, timber merchant, of Hull, which petition will be heard on the 5th of November. The Company was started in 1872 or 1873, with a capital of £300,000 in 6000 shares. As the collieries at Dodworth and Higham employ about 1000 men and boys, in addition to those engaged at the Company's iron-works at Wingfield, in Derbyshire, it is to be hoped some arrangements will be made to prevent the works standing. A special circular has also been issued to the Shareholders connected with the Thorpe Gawber Hall Collieries, Limited, calling a meeting of the Directors in London on Tuesday next, for the purpose, it is stated, of "affording them the earliest opportunity of communicating to the Shareholders important information which requires instant and most anxious consideration." In the meantime 20 of the horses and ponies, with other things belonging to the Company, are announced to be sold by public auction at Barnsley under a distraint for rent.

The quantity of both Silkstone and Barnsley thick coal which is being sent to London partakes of the improvement now manifesting itself in the coal trade. There is also rather more doing with the Eastern Counties as well as other places. It is rumoured that an attempt is being made to advance the price; but it is to be feared that with the vast output and the overstocked markets this will be difficult to maintain.

The steam coal trade is being well maintained, considering the period of the year. There is a good tonnage sent to Grimsby from South Yorkshire, and to Goole from the West Riding pits. The Hull trade is keeping well up. The quantity sent during the month of September was 112,224 tons—viz., 45,876 by water, and 66,348 tons by rail. The Denaby Main Colliery, near Mexborough, again heads the list, having sent largely by water. The West Riding Collieries, Manvers Main, Shireoaks, Lundhill, and other pits working a good quality of hard coal, are amongst the leading contributors. The official return shows that the largest exports have been sent to North Russia, Denmark, Germany, Italy, and other places.

The gas coal contracts which have been placed in various parts of the coal-field are in course of being executed, so that the quantity of this class of fuel raised is pretty large. Locomotive coal is also meeting a free sale, several of the largest railway companies being the best customers.

Makers of coke have no cause to complain, for although the output is very large, there is a fair demand for North Lincolnshire, Sheffield, and other places where smelting operations are conducted. At several places improved machinery is being supplied for washing and crushing the coal and slack. There is no alteration in prices, which have of late been pretty firm.

A very unsatisfactory state of affairs exists between the owners of several of the collieries and their men. At the West Riding Colliery, Normanton, near Wakefield, belonging to Messrs. Pope and Pearson, the owners are asking for a reduction in the rate paid for getting coal, so as to place them on an equality with the rate paid at the Whitwood Silkstone Collieries. A 14 days notice has been given to the men employed at the Hoyland Silkstone Collieries, near Barnsley, who are employed in the Silkstone seam, to leave their employment on the 20th of October. In the face of these reductions and closing of pits, owing to the owners being unable to make them pay, the officials of the South Yorkshire Miners Union have summoned a special conference to consider the desirability of demanding a general advance of wages.

The iron trade presents no new feature of interest. There is still a large output of pig iron, which meets a fair sale. At some places a moderate demand for merchant iron exists, whilst the Bessemer steel trade is lively. Some portion of the rolling mills have been idle for about a week. The Thorncliffe Works, which are noted for the production of gas and water pipes and gas apparatus of various kinds, are fairly off for orders in that department.

THE COAL AND GENERAL TRADES OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The gas coal trade from the Tyne has been somewhat kept back over the past eight or ten days by stormy weather, and likewise through a scarcity of handy sailing vessels, which have been needed to carry gas coals coastwise. Some contracts have been made, but they have not been upon a very large scale. As most of the leading collieries are pretty fully contracted, there has been a trifling advance upon some special qualities of coals which have been needed, but it has not been very general, and where the rise has occurred it has been small. A steady trade is transacting, but as much of the business has been arranged beforehand, the changes which are expected to occur between this time and Christmas are not likely to be of much importance on the general run of the transactions. In a month from this the Baltic will be practically closed for the season. Contractors who entered into large engagements to supply quantities of gas coals to the Russian gas companies have made an unfortunate speculation of it, so far as the shipments to Cronstadt are concerned. They calculated freight at a given figure, but it always kept beyond the estimate over the summer; and in October, on account of a failure of the grain crops in that empire, they are paying double what they estimated in freight to get the residue of their contracts away. Steam coals are in fair autumn demand. Coke, especially for consumption at the iron-works, continues to occupy a better position in the market.

The home freight market has a slightly upward tendency, mainly on account of the scarcity of sailing tonnage, which does not arrive in sufficient force for the requirements of trade. At the same time orders for vessels to load gas coals do not remain very long in the market. The rise in freight is about from 3d. to 6d. per ton all round. This does not affect the London supply, which is carried, as a rule, by regular steamers mainly belonging to the collieries or the gas contractors.

The Cleveland iron trade fluctuates a good deal at present, but manufacturers fail to establish much of an advance in the prices. They have been a little stiffer in the finished iron trade. Ironfounders have not received many new orders, however. They require more before they can keep their works regularly going.

The shipments of fire-clay goods begin to fall off, and the trade is now slack, especially in second-class qualities. The chemical market shows no improvement. The speculative element is entirely out of it for the present; except in the one article of soda, prices have hardly altered 1 per cent. over a month. This market was very much weakened with over-speculation in the early part of the year, and it has never recovered the effects of it. Lead has shown a tendency to advance, but this is very much the effect of speculations which are not likely to stand. The timber trade is unchanged. A speculative attempt to run prices up has failed.

Opening of New Gas-Works in Hereford.—The ceremony of opening the new gas-works which have been for some time in course of construction for the Hereford Corporation was performed on Tuesday last. The works appear to have given entire satisfaction, and we shall take an opportunity, in the next number of the Journal, of referring to the subject at greater length.

The Water Supply of Blackpool.—At the meeting of the Blackpool Town Council on Tuesday last—the Mayor (Alderman M'Naughtan) in the chair, a Committee who had been appointed to consider the subject of the water supply of the borough, and to visit the Fylde Water-Works reservoirs, reported that they had submitted to Dr. C. Brown, of Liverpool, samples of the water supplied by the Fylde Water Company, and the results of his analyses of such water not being, as they considered, satisfactory, they had inspected the reservoirs, and recommended that the Company be requested to adopt a satisfactory system of filtering the water supplied to the borough, to provide additional means of conveying and maintaining an efficient and regular supply, and prevent any possibility of a supply of water from the Calder. The report was adopted, and instructions given that a copy of it be sent to the Directors of the Company.

The Manchester Corporation New Gas-Works.—The Gas Committee of the Manchester City Council on Monday last week paid a visit to the new gas-works, Bradford Road, in order to inspect a portion of the works which has just been completed. During the past two years four large holders have been in course of construction, and two are now ready to be brought into use. Each is 150 feet in diameter and 105 feet high, and is capable of storing nearly 2 million cubic feet of gas. The holders are 3-lift, and are each supported by 20 massive pillars, 107 ft. 6 in. high. The tanks are 37 feet deep, and each holds 3½ million gallons of water. The excavating was done by Messrs. Worthington; Messrs. R. Neill and Sons had the contract for the brick and stone work; and the ironwork is in the hands of the Horseley Iron Company, Limited, Tipton, Staffordshire. It may be mentioned that each holder contains about 1000 tons of iron. One of the newly-completed holders was, on the occasion referred to, filled with air to its utmost capacity, and was much admired by the Committee. These two holders will be brought into use immediately for distributive purposes, the supply being obtained from the works at Rochdale Road. The other two holders will be completed in the course of the next twelve months.

The Water Supply and Sewerage of Axminster.—The Sanitary Authority at Axminster having resolved to provide a new water supply, and to properly drain the town, recently made an application to the Local Government Board for sanction to borrow £3000 for works of sewerage and sewage disposal, and £2500 for works of water supply, the result being that the Board sent down Mr. Arnold Taylor, one of their Inspectors, to hold an inquiry, which took place on Wednesday, the 29th ult. The Surveyor explained the plans of the proposed water-works, and said that from the three springs intended to be taken, there could be obtained 38,000 gallons of water in 24 hours. From gauging the springs as late as May, 1879, he found that at the No. 1 spring there were 20 quarts flowing in 74 seconds; at No. 2 spring, 20 quarts in 63 seconds; and at No. 3 spring, 20 quarts in 27 seconds. The population of the town of Axminster was about 1700 people, and the source would supply 17 gallons per head per diem of 24 hours. He also gauged the springs in the month of September, 1877, and then he found that No. 1 spring produced 195 gallons per hour; No. 2 spring, 229½ gallons per hour. The reservoir would hold 40,000 gallons. The inspector said there was one question to which he would allude—namely, to recommend that all who used the water be charged for it. The whole parish would have to pay towards the expense of the sewerage and water works, and from the former there would be no return of money, and he certainly thought those who consumed the water should pay for it. After some further discussion, it was decided that the Sanitary Authority and the Inspector should visit the springs, and that gangings of the water should be taken. The Inspection was made, the result being that the Inspector recommended that before the works were commenced, further search should be made, with the view of ascertaining for certain as to whether there would be sufficient water found at the places spoken of to supply the inhabitants. With reference to the sewerage works, the Surveyor said it was proposed to discharge the sewage on land belonging to the Lord of the Manor, for irrigation. After a few observations from the Inspector, the Clerk to the Sanitary Authority said he would ask, on behalf of the Authority, that the question of the disposal of the sewage be adjourned for the purpose of revising the plans; and this was agreed to.

SINGULAR GAS EXPLOSION AT NEWPORT (MON.).—A singular gas explosion occurred at the Queen's Hotel, Newport, on Friday afternoon last. The kitchenmaid was in the act of cleaning a gas-cooking stove, which she evidently did not understand, as she allowed the gas to escape till it exploded with a loud report, and a force that made the house shake. The kitchen windows were blown out, and the contents of the room damaged, but this appears to have been the extent of the injury to the property. The kitchenmaid, in addition to being greatly terrified, sustained a contusion of the knee, but otherwise she is not believed to be seriously injured.

THE WATER SUPPLY AND SEWERAGE OF PONTEFRACT.—At the meeting of the Pontefract Corporation, on Thursday last—the Mayor (Mr. J. Moxon) in the chair—it was resolved to borrow £10,000 for works of sewerage. Mr. Barstow, with reference to the town's supply of water, said the wells were not failing, but the demand had much increased lately, owing to the great number of houses supplied. He advocated strongly the sinking deeper of the wells, which would yield a more plentiful supply. Alderman Robson favoured an additional pumping-station being erected, instead of interfering with the present supply, and this proposal seemed to meet with general approval.

WASTE OF WATER IN SELBY.—At a special meeting of the Selby Local Board on Friday, the 1st inst.—Mr. R. Blackburn in the chair—it was reported that in consequence of the waste of water that had been going on in the town, the Water-Works Committee had made three inspections of their districts, with the view of reducing it. Although the inspection had, to a certain extent, been successful, yet the great loss of water still existing was of serious importance, it being at the rate of 5000 or 6000 gallons per head. A lengthy discussion ensued, and it was finally agreed that the figures contained in the report presented on the subject should be handed, with a record of the pumping of the engine, to Mr. Fenwick, C.E., of Leeds, for his consideration.

THE AWARD IN THE BIRMINGHAM GAS-WORKS ARBITRATION CASE.—At the meeting of the Oldbury Local Board on the 1st inst.—Mr. B. T. Sadler in the chair—the Gas Committee reported that a copy of a notice had been received from Sir Henry Hunt, stating that the award in the gas arbitration case was ready, and would be handed over to the first party applying for it on payment of £395 18s. 9d. The Birmingham Corporation having consented to pay half the amount, the Committee recommended the Board to take up the award on those terms, and draw a cheque for £197 19s. 4½d., the amount due from Oldbury. A letter was read from Mr. E. J. Hayes, the Town Clerk of Birmingham, stating that he had received instructions to take up the award in the gas arbitration, and to furnish the Oldbury Local Board with a copy of it; the vendors and purchasers paying the charge in equal proportions, as was done in the case of West Bromwich. On the motion of the Chairman, it was decided to grant a cheque for the Oldbury share of the expenses, and the Clerk was instructed to take the necessary steps to obtain the award.

THE WATER SUPPLY OF PAIGNTON.—Some complaints having arisen as to the purity of the water supplied to Paignton, the Local Board determined on having samples of the water analyzed. This was accordingly done, and at the meeting of the Board on Monday last week, the report of the Analyst (Mr. E. Smith, of Torquay) was presented. It stated that two of the three samples of water submitted to him were free from all organic and inorganic impurities, were thoroughly sound and wholesome, and might safely be used for potable or any domestic purpose. The other sample was free from inorganic impurity, but yielded slight indications of organic impurity; not sufficient, however, to render the water unfit for use. This organic matter was in an unoxidized condition, and was therefore most likely derived from a source not far distant from the place whence the sample was taken—possibly from an unclean cistern or other receptacle. On standing, all three samples deposited a fine greyish-white matter, which under the microscope was found to be chiefly amorphous vegetable *débris*. Efficient filtration would therefore be desirable. The report was received.

SEWER VENTILATION BY STREET LAMP-PILLARS.—Mr. C. S. Robinson, the Engineer and Manager of the Leicester Corporation Gas-Works, in a letter to *The Times* on this subject, last week, said: "In these days of steam rollers it is a very common thing for a gas-main to be broken, and for the gas to escape into the sewer in such quantities as to be very dangerous. Of course, such accidents are soon found out and remedied; but if Dr. Fitzgerald's plan of ventilating the sewer up the lamp-posts were adopted, the possibility is that in the meantime the lamplighters would sometimes explode the sewer when lighting the lamp. Attention has been called to the danger of fixing any sewer ventilators near windows. Allow me to suggest to your readers the great risk arising from the plan, frequently adopted by architects and builders, of attaching soil-pipe ventilators to chimneys or near them, for, as every one knows, when there is no fire in a room, it is a very common thing to find a down-draught, especially in winter and in bed-rooms; and when sewer gas is allowed to escape near such a chimney, the air coming down the chimney will undoubtedly be contaminated with sewer gas."

THE WATER SUPPLY OF PONTYPRIDD.—At the monthly meeting of the Pontypridd Urban Sanitary Authority on the 1st inst., Dr. R. Hopkins, the Medical Officer of the Board, submitted a report upon the water supplied by the Pontypridd Water-Works Company, respecting which there has been some complaint. The water supplied, he said, was that which was generally known as upland surface water, and when pure was wholesome, moderately palatable, and soft—in fact, eminently fitted for drinking and domestic purposes. The grievance was due to the scanty supply which had of necessity followed the long-continued drought experienced in that and other parts of the country during the last few weeks, as well as the brownish colour of the water, which was due to the peaty soil whence it flowed. The only impurities the water contained were carbonate of iron and some vegetable organic matter. The carbonate of iron, although found, did not obtain to such an extent as to impart a chalybeate taste to the water, and even if this was the case the principal symptoms would be of a dyspeptic nature. He was of opinion that if the water had been properly filtered during the period of the scanty supply, not even the impurities referred to would have been found in excessive quantities. The water was perfectly free from what was by far the most important class of water impurities—viz., animal organic matter. The report was adopted.

BOLTON CORPORATION WATER SUPPLY.—The Bolton Borough Treasurer recently submitted to the Water-Works Committee his annual financial report on the receipts and expenditure of the water department. The receipts, it appears, amounted last year to £39,327 7s. 5d., as against £37,159 13s. 6½d. in 1878-9, showing an increase of £2167 13s. 10½d. While the receipts last year were greater than the previous one, the expenditure was less than in 1878-9 by £198 19s. 4d., the figures being £32,754 4s. 1d. and £32,953 3s. 5d. The receipts for last year were made up as follows:—To balance in hand, 1½d.; water supply for domestic purposes, £24,384 17s. 6d.; water supply for trade purposes, £10,633 5s. 4d.; water supply for building operations, £152 7s. 6d.; Local Boards—Leigh, Hindley, &c., £2443 19s. 6d.; casual supplies, £18 2s. 10d.; rent of Entwistle and other farms, &c., £86 9s.; hay grass sold, £4 15s.; filling reservoirs, &c., £16 8s. 4d.; fishing rights, £35; sundries, £9 9s. 11d.; fines charged for non-payment in advance, £278 3s. 5½d.; and fitting trade profit, £1264 8s. 11d. The following items comprise the expenditure:—Officers salaries, £1532 14s.; maintenance of works, £2117 5s. 10d.; rents and rent-charges, &c., £5718 7s. 7d.; rates and taxes, £2012 8s. 3d.; miscellaneous expenses, £517 8s. 7d.; interest, £18,694 16s.; sinking-fund, £927 17s. 2d.; and instalment of public works loan, £1233 6s. 8d. From the above it will be seen that last year the receipts exceeded the expenditure by £6573 3s. 4d., and of this £1000 was placed to the renewal-fund, and £2500 transferred to the borough-fund on account, leaving an available balance of £3073 3s. 4d. Out of the profits the previous year nothing was placed to the renewal-fund, £3000 was transferred to the borough-fund on account, and an available balance was left of £1206 10s. 1½d.

Register of Patents.

APPLICATIONS FOR LETTERS PATENT.

4027.—MILLS, B. J. B., Southampton Buildings, London, "Apparatus for checking the waste of water." A communication. Oct. 4, 1880.

4041.—GREEN, N. G., New York, U.S.A., "Improvements in the method of obtaining an increased water supply for cities, towns, manufactories, and for other purposes, and in apparatus for the same." A communication. Oct. 5, 1880.

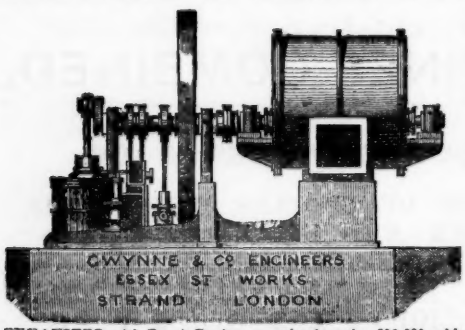
4075.—CLAYTON, S., Bradford, Yorks, "Improvements in motor engines worked by gas or combustible vapour and air." Oct. 7, 1880.

PATENT WHICH HAS PASSED THE GREAT SEAL.

1661.—BECKTON, J. G., Middlesbrough-on-Tees, Yorks, "Improvements in the distillation of coal and other substances, the manufacture of coke, charcoal, and 'patent fuel,' utilizing the gases therefrom, and in apparatus employed therein." April 22, 1880.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

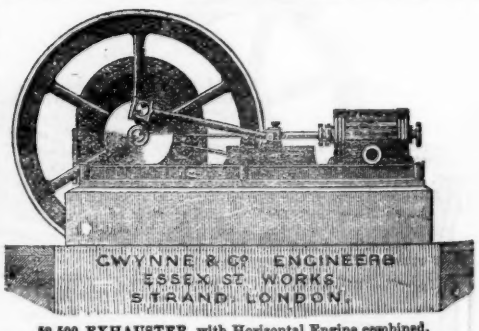
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

WANTED, Readers of the NEW Edition, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, Assoc.M.I.C.E., Gas-Works, SYDENHAM.

WANTED, a Situation as Clerk or TIME-KEEPER, Gas-Works preferred. Several years experience as above. Aged 22 years.
For particulars, apply to J. H. G., No. 5, Chapel Street, New Walsoken, near WISBECH.

WANTED, by a Young Man, aged 25, a Situation as GAS-FITTER. Is used to Service-Laying and Fixing Meters and Taking Indices of Meters, and used to Compo Fixing and Iron, or to work a small Gas-house, and do Repairs that are required.
Apply to WM. HUCKLE, care of Mr. T. Brown, London Road, Stony Stratford, BUCKS.

WANTED, by the Advertiser, a Young Man, aged 27, an Engagement in a Gas Company's Office, Assistant Engineer, or Clerk of Works, &c., has had every experience in a Gas-Works. First-class testimonials and references.
Address No. 695, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED.—The Advertiser, a Young Man, aged 39, married, is open for an Engagement as MANAGER and SECRETARY of a medium-sized Gas-Works, or SUB-MANAGER of a large Works. Has a thorough Knowledge of the Manufacture and Distribution of Gas in all its branches, having had sole management of Gas-Works for 16 years. Highest testimonials and references.
Address No. 678, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED immediately, for the High- bridge Gas-Works, a WORKING MANAGER, where five retorts are kept at Work from Michaelmas to Lady-Day, and two or three at other times. He must be a steady and reliable man with a perfect knowledge of his work. House, garden, gas, and coal.
Address with copies of testimonials to the SECRETARY of above.

WANTED, good Second-hand Purifier, about 6 ft. by 4 ft., 3 ft. deep, 8 in. lute.
Address Fydu Iron and Tin Plate Company, Newport, MONMOUTH.

GAS-WORKS for Sale in a rapidly im- proving neighbourhood, within 20 miles from London. Present rental about £700 per annum, which can be largely increased.
Apply, for particulars, to BETA, Messrs. Plunkett and Leader, Solicitors, 60, ST. PAUL'S CHURCHYARD, E.C.

ON SALE—The Cast-Iron Fire Doors, Mouthpieces, Ascension, H, and Dip Pipes, Hydraulic Mains, &c., belonging to six settings of six retorts; One Station Meter to pass 8000 feet per hour (makers West and Gregson); also nine D-shaped clay retorts, 16 in. by 14 in. by 8 feet.
The above are in capital condition, and can be seen at the Gas-Works, Guildford. No reasonable offer refused.
Further particulars on application to Mr. LONGWORTH, Gas Offices, GUILDFORD.

AMMONIACAL LIQUOR FOR SALE.

THE Directors of the Dronfield Gas- light and Coke Company invite TENDERS for the Purchase of the AMMONIACAL LIQUOR produced at their Works from Nov. 1, 1880, to Dec. 31, 1881.
Tenders, stating price per ton at the Works, or delivered in casks at Dronfield Railway Station, to be sent to me not later than the 31st inst.
The Directors do not bind themselves to accept the highest or any tender.
CHRISTOPHER THORPE, Secretary.
Chesterfield, Oct. 2, 1880.

RYDE, ISLE OF WIGHT.

TO CAPITALISTS, GAS SHAREHOLDERS AND INVESTORS GENERALLY.

IMPORTANT SALE OF GAS SHARES.

MESSRS E. MARVIN and SONS will SELL by AUCTION, at Yelf's Hotel, Ryde, on Thursday, Oct. 21, 1880, at Six for Seven o'clock in the evening, 69 SHARES, in the Ryde Gaslight Company—viz., 23 Originals paying 9 per cent., and 46 of later issues paying 7 per cent., all of the nominal value of £12 10s. each.
Particulars and conditions of sale may be obtained of J. W. FARDELL, Esq., the Vendor's Solicitor, Cambrian House Offices, or of the AUCTIONEERS, at their Auction and Estate Agency Offices, No. 9, Union Street, Ryde, ISLE OF WIGHT.

The New River, unquestionably the choicest home investment of this or any other age.—Freehold Shares and New Shares, in lots to suit all classes of capitalists.

MESSRS EDWIN FOX & BOUSFIELD will SELL, at the Mart, on Wednesday, Nov. 3, at Two, in Lots, Valuable Freehold Properties, comprising ONE-EIGHTH part of a SHARE in the ADVENTURER'S MOIETY and ONE-TENTH part of a SHARE in the KING'S MOIETY of the Estates and Interests of the New River, and Thirty £100 NEW SHARES.
The New River occupies an unrivalled position among trading corporations in that its income has never retrograded, while it has annually advanced until it has now reached the enormous sum of over £400,000 per annum, and is literally without limit as to its future accretions. In addition to the revenue derived from water, there is a considerable income from land, the Company being possessed of important estates in London and the counties of Middlesex and Herts. The Myddelton Square Estate alone occupies over 50 acres of land, and as the leases fall in in about 27 years, there is a vast value in reversion. Now that the purchase of the Water Companies has been relegated to inquiry, no action will be taken for years, and in the meantime it may safely be predicted that the income of the New River will be advanced to such an extent that whatever basis of calculations may be adopted, when the time for purchase does come a much larger sum will have to be paid to the proprietors than would have been the case under the defunct scheme of the late Government.
Particulars of MESSRS. LEWIN AND CO., Solicitors, 32, Southampton Street, STRAND; MESSRS. RUSSELL, SON, AND SCOTT, 14, Old Jewry Chambers, E.C.; at the Mart; and of MESSRS. EDWIN FOX AND BOUSFIELD, 99, Gresham Street, BANK, E.C.

FOR SALE.—In consequence of the decease of Mr. Milne, a GAS-WORKS in a small Manufacturing Town in Ulster. Present make 1½ millions, which might be increased.
For particulars apply to ALEXR. MILNE AND CO., Gas-Works Lessees and Engineers, 11, Chichester Street, BELFAST.

BLACKBURN CORPORATION GAS DEPARTMENT.

EXHIBITION OF GAS OVENS, STOVES, ENGINES, BURNERS, AND OTHER APPLIANCES AND INVENTIONS FOR THE ECONOMIC USE OF GAS FOR DOMESTIC AND MANUFACTURING PURPOSES.

THE Gas Committee of the Blackburn Corporation have determined to hold an Exhibition as above stated in the

ASSEMBLY ROOMS, TOWN HALL, BLACKBURN,

To commence on the 10th of November, and continue for Twelve Days.

As the Committee wish to make the Exhibition a success, no application for space will be entertained after the 25th of October.
Forms of application for space and any information required may be had from the undersigned.
S. R. OGDEN, Engineer and Manager.

IMPERIAL CONTINENTAL GAS ASSOCIATION.
(INCORPORATED BY ACT OF PARLIAMENT.)
NOTICE is hereby given that the HALF-YEARLY ORDINARY MEETING of the PROPRIETORS of the Imperial Continental Gas Association will be held at the City Terminus Hotel, Cannon Street, London, on TUESDAY, Nov. 2 next, at Two o'clock in the afternoon precisely, when a report will be made to the Proprietors, a Dividend declared for the half year ended June 30, 1880, and the usual ordinary business of such meeting transacted.
Notice is hereby also given that the Transfer Books will be closed on Tuesday, the 19th inst., and will remain closed until the 3rd prox.
By order of the Board,
R. S. GARDINER, Secretary.
30, Clement's Lane, Lombard Street,
London, E.C., Oct. 11, 1880.

THE Gloucester Gas Company have the undermentioned APPARATUS for Sale:—
About 150 feet of D-shape Wrought-Iron Hydraulic Main, size 19 in. by 19 in. Also about 38 ft. of D-shaped Wrought-Iron Hydraulic Main, size 20 in. by 20 in. Annular Condenser, consisting of six Vertical Pipes, 24 in. diameter, 19 ft. high, with three 12-in. Slide-Valves and 12-in. Connections.
Scrubber (round), 5 ft. by 20 ft., with three 12-in. Slide-Valves, and 12-in. Connections.
Exhauster (Jones) to pass about 15,000 feet per hour.
Exhauster (Beales) to pass about 25,000 feet per hour.
Two Vertical Steam-Engines, each about 6-horse power, with Pulleys, and Shafting used for driving the above.
Boiler 14 ft. 6 in. by 3 ft. 6 in., with Centre Tube, and four Galloway Patent Tubes.
4-horse power Horizontal Steam-Engine.
Two Purifiers, 16 ft. by 8 ft., with six 12-in. Slide-Valves and 12-in. Connections.
Gasholder, Double Lift, with Cast-Iron Tank, capacity 37,000 feet.
Gasholder, Double Lift, capacity 100,000 feet.
Gasholder, Double Lift, capacity 240,000 feet.
One 12-in. Governor, by Wright, London, with 12-in. Valves, Bye-Pass, and Connections.
Two 12-in. four-way faced Valves, by Cockey.
For further information, &c., apply to the undersigned.
R. MORLAND, Engineer.

TO IRONFOUNDERS.

THE Water-Works Committee of the Heywood Local Board invite TENDERS for the Supply of 2200 Yards of 6-in., and 2200 Yards of 4-in., Turned and Bored CAST-IRON PIPES.
Specifications may be seen and further information obtained on application to Mr. James Diggle, Water-Works Manager, Miller Street, Heywood.
Sealed tenders, endorsed "Iron Pipes," to be addressed to the Chairman of the Water Committee, and sent to me not later than Saturday, the 16th of October next.
The Committee do not bind themselves to accept the lowest or any tender.
JNO. BANKS, Clerk to the Local Board.
Office of Local Board, Heywood, Sept. 28, 1880.

SOUTHPORT CORPORATION GAS-WORKS.

TO TAR DISTILLERS AND OTHERS.

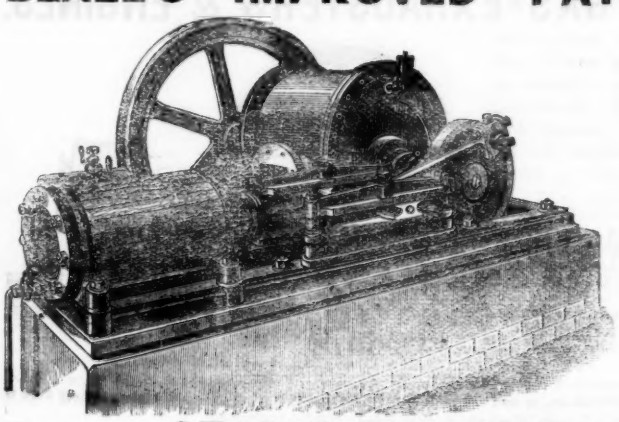
THE Gas Committee are prepared to receive TENDERS for the Surplus TAR produced at the Gas-Works for a period of One or Two years from the 18th of November next
Further particulars may be obtained on application to Mr. Booth, Gas Manager.
Tenders, endorsed "Tar," to be sent in to me not later than Wednesday, Oct. 27 next.
By order,
J. H. ELLIS, Town Clerk.
Town Hall, Southport, Sept. 25, 1880.

THE Cleethorpes Gas Company are pre- pared to receive TENDERS for the AMMONIACAL LIQUOR produced at their Works from Oct. 1, 1880, to Dec. 31, 1881.
Tenders, stating price per ton, delivered free in Contractor's tanks or casks at Cleethorpes Railway Station, to be sent in not later than Oct. 31, 1880.
WM. HEAFORD DAUBNEY, Secretary.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS,

WITH

Wrought-Iron Spindles and ENGINES COMBINED.



SOLE MAKERS,

GEORGE WALLER & CO.

MAKERS OF ENGINES, EXHAUSTERS,
INDEX AND DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, AND OTHER PUMPS,
SCRUBBERS AND PURIFIERS,
CONDENSERS, BOILERS, &c.

G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.
[SEE ALSO ADVERTISEMENT, PAGE 590.]

Phœnix Engineering Works:
HOLLAND STREET, SOUTHWARK, S.E.

MR. CORBET WOODALL, C.E.,

Has Removed his Office to

PALACE CHAMBERS, BRIDGE STREET,

WESTMINSTER, S.W.

NOTICE OF REMOVAL.

THE OWNERS OF
THE
BIRTLEY IRON-WORKS
AND
PELAW MAIN COLLIERIES

Have REMOVED their London OFFICES from No. 101, Cannon Street, to No. 46, Cannon Street.

Their Warehouse for Gas and Water Pipes and other Castings is at Scott's Wharf, Bankside, SOUTHWARK.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

COLCHESTER GAS COMPANY.

THE Directors of the Colchester Gas Company are prepared to receive TENDERS from competent persons for the following WORKS:—

Contract No 4.—The Delivery and Erection of a Telescopic Gasholder 90 ft. in diameter and Appendages.

The drawings and specification may be seen and forms of tender with quantities obtained, on payment of one guinea (which will be returned if a *bonâ fide* tender be made) at the Offices of the Gas Company, Queen Street, Colchester, or of Mr. G. W. Stevenson, Engineer, 38, Parliament Street, Westminster; and sealed tenders, properly endorsed, must be delivered, addressed to J. B. Harvey, Esq., J.P., Chairman of Directors, at the Offices of the Company, on or before Friday, Oct. 29, 1880.

The Directors do not bind themselves to accept the lowest or any tender.

By order,
J. T. BROWNING, Manager and Secretary.

TO TAR DISTILLERS.

THE Directors of the Colchester Gas Company invite TENDERS for the Surplus TAR produced at the Gas-Works for a period of One, Two, or Three years, from Dec. 31, 1880.

Further particulars may be obtained on application to the undersigned.

Tenders, endorsed "Tar," to be sent in not later than Nov. 10, 1880.

By order,
JOHN T. BROWNING, Manager, &c.
Colchester, Oct. 9, 1880.

BOROUGH OF READING.

THE Reading Urban Sanitary Authority are desirous of receiving TENDERS for a Supply of GAS TAR for a term of One year. The quantity required will be about 10,000 gallons, which is to be delivered at the Store Yard, Caversham Road, or at either of the Railway Stations, in quantities not less than 20 barrels at one time when required, and must be free from Ammoniacal Liquor.

Tenders to be delivered to me, sealed and endorsed "Tender for Gas Tar," not later than 5 p.m. on Wednesday, the 20th of October inst.

ALBERT W. PARRY, Borough Surveyor, &c.
Town Hall, Reading, Oct. 5, 1880.

GARSIDE'S IMPROVED MAIN DRILLING CLIP.

No. 1 takes from 2-in. to 6-in. Mains.
No. 2 takes from 6-in. to 12-in. Mains.

GARSIDE'S REGISTERED TUBE-VICE takes ¾ brass to a 2-in. Socket.

May be had direct from the maker, SAMUEL GARSIDE, Gatefield Iron-Works, ASHTON-UNDER-LYNE.

Price 28s. each, handsomely bound in Morocco, cloth sides, gilt edged and lettered.

THE FIRST AND SECOND VOLUMES
OF
KING'S TREATISE

On the Science and Practice of the Manufacture and Distribution of

COAL GAS.

Edited by THOS. NEWBIGGING, C.E., M.Inst.C.E. and W. T. FEWTRELL, F.C.S.

Orders received by
WALTER KING, 11, Bolt Court, Fleet Street, London, E.C.

JOHN HALL AND CO., STOURBRIDGE,
Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

J. & H. ROBUS,
BUILDERS AND CONTRACTORS
FOR THE ERECTION AND REBUILDING OF GAS AND WATER WORKS,
RETORT-SETTING—A SPÉCIALITÉ.

ROBUS'S IMPROVED RETORT-SETTINGS, guaranteed to Carbonize a large amount of Coal with a small per cent. of Fuel.

ESTIMATES GIVEN FOR MAIN-LAYING.

N.B.—All kinds of Fire Goods and Gas Apparatus supplied on the shortest notice.

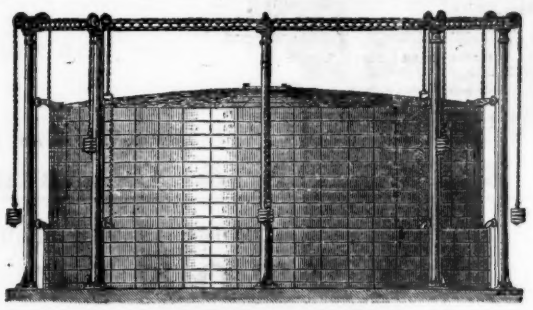
Address:—J. & H. ROBUS, BELL GREEN, CATFORD, LONDON, S.E.

GEORGE ORME & CO.,
ATLAS METER-WORKS, OLDHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
STATION-METERS, GOVERNORS,
PRESSURE AND EXHAUST REGISTERS,
LAMP-METERS IN CAST-IRON BOXES,
And every Description of Gas Apparatus.

JAMES MILNE & SON,
GAS ENGINEERS,
Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,
EDINBURGH, AND
2, KING EDWARD STREET,
NEWGATE STREET, LONDON.

STATION-METERS GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.



J. T. B. PORTER & CO.,
GAS ENGINEERS & MANUFACTURERS,
IRONFOUNDERS AND CONTRACTORS,
GOWTS BRIDGE WORKS,
LINCOLN.

LONDON OFFICES: 1, WESTMINSTER CHAMBERS, S.W.

ESTIMATES FOR GAS-WORKS OF ANY SIZE.
REFERENCES TO 500 WORKS ALREADY ERECTED.

N.B.—All Communications to be addressed to the FIRM ONLY.

GAS APPARATUS EXHIBITION IN GLASGOW.

PHILP'S COCKBURN HOTEL,

141, BATH STREET, GLASGOW.

This Large New Hotel is in connection with the well-known Cockburn Hotel, Edinburgh, and conducted on the same principles.

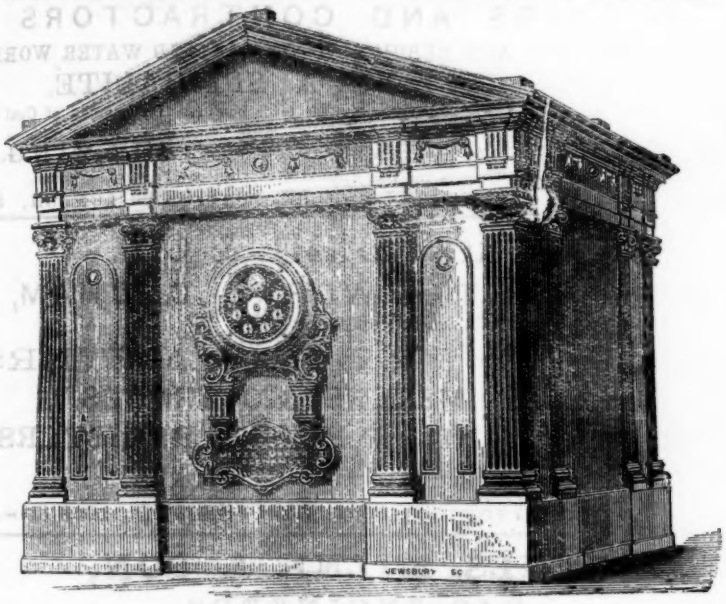
CHARGES MODERATE.

Special Terms for Parties staying a week or longer.

J. PHILP, PROPRIETOR.

GEORGE NEWTON,

UNION STREET WEST, OLDHAM,



MANUFACTURER OF

SQUARE STATION-METERS, with PLANED JOINTS;

ROUND STATION-METERS, WITH CAST-IRON STANDS;

WET AND DRY CONSUMERS GAS-METERS, GOVERNORS, &c.

PRICE'S PATENT COKE & COAL BARROW

effecting a great saving of time, labour, and expense.

For particulars, price, &c., apply to Mr. E. PRICE, Inventor and Patentee, Gas-Works, Hampton Wick, MIDDLESEX.

Prices are Reduced.

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications addressed to J. SUGG & Co., GHENT, will receive immediate attention.

THE

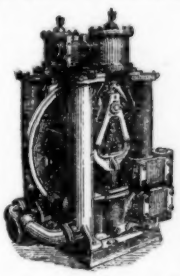
SILICA FIRE-BRICK CO.,

OUGHTIBRIDGE

Near SHEFFIELD,

Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

John Cameron's Specialities



ARE HIS

PATENT LEVER

PUNCHING MACHINES

AND HIS

STEAM-PUMPS

FOR

GAS-WORKS,

Feeding Boilers, Steam Fire-Engines, Colliery Deep Lifts, Irrigation, Contractors, and Chemical purposes.

WORKS:

OLDFIELD ROAD, SALFORD, MANCHESTER.

NEW PATENT GAS-EXHAUSTERS.

[J. BEALE'S.]

MESSRS. B. DONKIN & Co. possess the sole right to manufacture J. Beale's Exhausters under his new patent.

MADE WITH TWO OUTSIDE BEARINGS AND LATEST IMPROVEMENTS.

ALSO MANUFACTURERS OF

IMPROVED GAS AND WATER VALVES, STEAM-ENGINES, &c., &c.

B. DONKIN & Co., BERMONDSEY, LONDON.

ECONOMY IN THE PRODUCTION OF GAS.

PLUTONIC CEMENT,

FOR JOINTING AND REPAIRING RETORTS AND OVENS *in* ACTION AND *out* OF ACTION.

Pamphlet on the advantages of the above, with Modes of Application, References, Prices, &c., free by post, from the Sole Manufacturer,

WILLIAM RICHARDSON, Gas and Hydraulic Engineer, CHARLES HENRY STREET, and BISSELL STREET, BIRMINGHAM.

THE FARNLEY IRON COMPANY, LIMITED,

FARNLEY, near LEEDS,

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

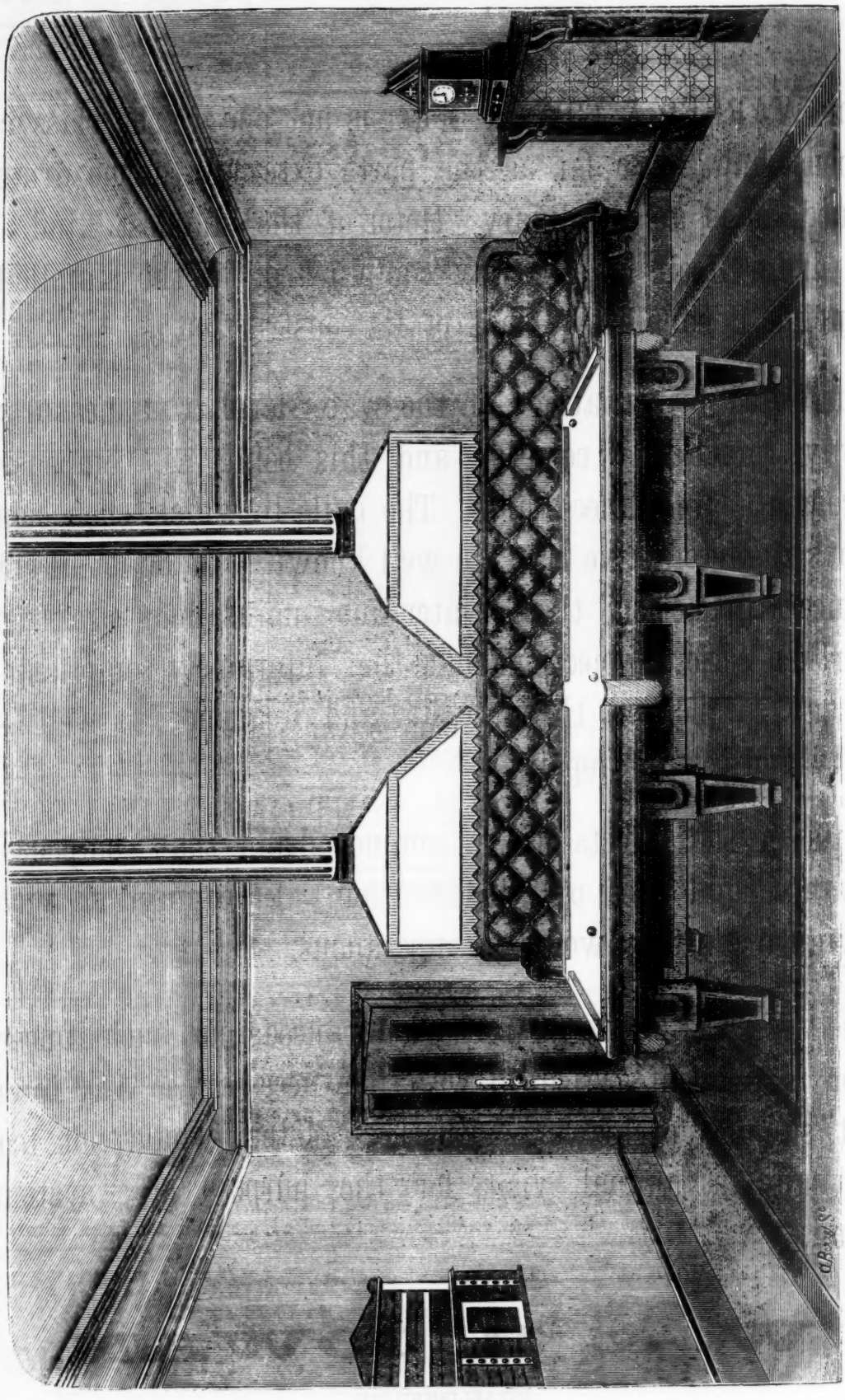
London Agent for Gas-Retorts: D. W. OGG, 3, Jeffrey's Square, St. Mary's Axe, E.C.

" " Glazed Bricks: A. BARFIELD, 22, Great George Street, Westminster.

THE LATEST NOVELTY

FOR THE EFFECTIVE LIGHTING of BILLIARD TABLES.

BILLIARD TABLE LIGHTING BY WILLIAM SUGG'S PATENT SELF-VENTILATING SYSTEM AND BURNERS OF HIGH ILLUMINATING POWER,



Securing a Total Absence of Heat and Shadow, with a Steady and Brilliantly White Light, and Small Consumption of Gas.

N.B.—All products of combustion are carried away into the open air, and cannot, therefore, mix with and vitiate the atmosphere of the room.

One of the above has been fitted up in the Billiard-Room of the Raleigh Club, Regent Street, and the Secretary states that the Table is the best lighted he has ever seen.

APPLY TO

WILLIAM SUGG,

VINCENT WORKS, WESTMINSTER, & GRAND HOTEL BUILDINGS, CHARING CROSS.

SIMPLE v. COMPLEX METERS.

The WARNER & COWAN Meter is not one of the class called "Compensating." So far as the parts external to the drum are concerned, it is an "Ordinary" Meter of the simplest kind. Nor is the drum itself in any way complicated, for the simplicity of its principle is equalled by that of its construction.

Unaffected by variations of the water-level, the measurement is always practically correct; and this being so, compensating arrangements are unnecessary. The evils to which such complex additions to Meters give rise, are well known. Of doubtful efficacy and uncertain action, these water-line maintainers are open to the further serious objection that they injuriously complicate the Meter, and so increase the necessity and frequency, as well as the difficulty and cost, of repairs.

It is in the defects of the common drum that compensating contrivances find their only justification. In connection with an unvarying drum they would be superfluous.

The WARNER & COWAN drum needs no such uncertain aid, nor is frequent periodical watering necessary. Any town or district, supplied exclusively with these Meters, would not require more than an annual visit for the purpose of "systematic watering."

W. & B. COWAN,

(ESTABLISHED 1827,)

CHURCH ST., MILLBANK ST., *LONDON, S.W.* | DUTTON ST., NEW BRIDGE ST., *MANCHESTER.* | BUCCLEUCH ST. WORKS, *EDINBURGH.*

The understated declaration with which we introduced our apparatus when the Argand system was in the full tide of its fame, has been fully borne out by general experience, namely—

"THE FLAT-FLAME IS THE ONLY PRACTICABLE SYSTEM FOR STREET LIGHTING; and, 'in actual use,' yields as much light with Common Gas, and more with Cannel Gas, than any Argand System."

CHARLES HUNT, Esq. (President of the British Association of Gas Managers), in his Inaugural Address to the members at their annual meeting, held in London, June, 1880, said: "Rivalry has stimulated into being, for outdoor purposes mainly, Burners of large power, that have fully maintained the superiority of coal gas over the electric light. To Mr. Bray our thanks are due for his development of the **FLAT-FLAME BURNER** into a lighting medium of a very high order, *and for his vindication of its claims to practical consideration.*"

The above declaration was received with marked applause by the crowded meeting.

BIRMINGHAM LAMP TESTS.

AFTER the most exhaustive series of experiments, extending over more than twelve months, with the most extensive assortment of Burners and Lanterns of large lighting power ever brought together, the Birmingham Authorities have

ADOPTED BRAY'S SYSTEM

for their Street-Lighting Improvements, for which purpose Sixty-Five 100-candles power Lanterns of medium lighting power are being fixed.

The apparatus used in the above tests were all of our usual medium lighting power class, and the tests showed that we sacrifice a considerable amount of lighting power for general efficiency. The tests further showed that our 80*-candles* HIGHEST *lighting power burner yielded* 3·51 *candles per foot of gas—the quality being* **16·75** *candles* (3·35 *per foot) by the standard—which was a higher result than that yielded by any other flat-flame burner, though copies of our Slit-Unions, enlarged and improved by us Jan.,* 1879, *were used by our competitor; and higher than the* 80*-candles power Argands.*

NOTE.—The above is the most conclusive answer to the ever-changing and misleading statements which are being made by our competitor, with the object of taking from us the honours we have secured in open contest.

Extract from the *Leeds Mercury*, April 1, 1880.

At the meeting of the Leeds Town Council, March 31, Alderman Gaunt moved that the Council approve of the acceptance by the Corporate Property Committee of the tender of Messrs. Geo. Bray and Co. for the supply of 21 new lamps, to be placed upon the pillars round the Town Hall. The Committee had tested Sugg's and other lamps, and found Messrs. Bray's the best. It was intended to have two 200-candles power and two 100-candles power, and 17 round the hall of 80-candles power. Mr. Lynd, in seconding the motion, said that he had had an opportunity of seeing different lamps tested at Birmingham, and he was in favour of Messrs. Bray's.

Extract from the *Daily Free Press*, Aberdeen, Jan. 1, 1880.

Judging of the merits of the lights as they appeared last night, on-lookers seemed to be generally of opinion that between Sugg's patent and Bray's larger light at the corner of Union Buildings, Castle Street, there was no perceptible difference in the illuminating power. When the vital question of gas consumption is taken into account, it is found that in the Castle Street lamps there is a marked difference in the quantity of gas consumed, for while 30 feet of gas are hourly burned in Sugg's Patent Lamp, only 20 feet are used by Bray's Lamp during the same period.

[**The above Lamps have Meters attached.**]

BRAY'S LANTERNS have been adopted by the Vestry of St. George, Hanover Square, London, for all the crossings and refuges of that important district, after a direct competition with the Argand system of lighting.

Also more than 50 Towns and Vestries have adopted them, after a similar competition in most cases; and many private users. In all cases they are a pronounced success.

GEORGE BRAY & CO., BLACKMAN LANE, LEEDS.

June, 1880.

For Heating only.

RITCHIE'S
GAS OR OIL
HEATING AND LIGHTING
STOVES.

Silver Medal awarded in 1878, at Wolverhampton Exhibition.

No Injury to Pictures or Plants.
No Flue.
No Danger from Fire.
No Offensive Smell.
Light and Warmth combined.
Cost less than other Fuel.

Messrs. Ritchie & Co. are prepared to supply these Stoves on the best possible terms to Gas Companies to let out to their Consumers on the hire system.

Prices from 50s. to £10 10s.

Full Particulars and Testimonials forwarded on application to

RITCHIE & CO.,
23, ST. SWITHIN'S LANE, LONDON, E.C.

For Light & Heat.

R. DEMPSTER AND SON'S
WOOD SIEVES FOR PURIFIERS,

WITH TAPER OR PARALLEL BARS,
MADE BY SPECIAL MACHINERY.
SCRUBBERS FILLED WITH BOARDS,
On our approved principle, for the extraction of Ammonia.

Prices on application. References to First-Class Engineers.

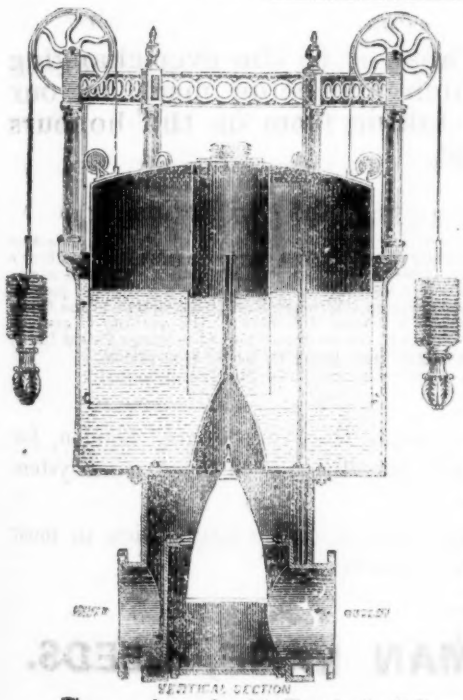
ROSE MOUNT IRON-WORKS,
ELLAND, Near HALIFAX.
London Offices: 2, SUFFOLK LANE, CANNON STREET, E.C.

J. & J. BRADDOCK,
GLOBE METER-WORKS, OLDHAM,
MANUFACTURERS OF
WET AND DRY CONSUMERS GAS-METERS,
OF THE HIGHEST EXCELLENCE ONLY;
ROUND STATION-METERS,
ON CAST-IRON STANDS;
SQUARE STATION-METERS,
WITH PLANED JOINTS.

Messrs. Braddock beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 30-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

C. & W. WALKER'S
WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

MIDLAND IRON-WORKS,
DONNINGTON, Near NEWPORT, SHROPSHIRE.
FINSBURY CIRCUS, LONDON.

ESTABLISHED IN 1860.

BENJAMIN CARPENTER,
THE ORIGINAL MANUFACTURER OF THE IMPROVED
WOOD SIEVES
FOR
GAS PURIFIERS & SCRUBBERS.

PROVIDENCE WORKS,
22, HERMES STREET, PENTONVILLE ROAD,
LONDON, N.

TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE
FIRE CLAY & BRICK WORKS,
STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Shipments Promptly and Carefully Executed.

JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Manufacture and keep in stock at their works (also a large stock in London) PIPES and CONNECTIONS 1¼ to 48 inches in diameter; and make to order Retorts, Purifiers, and Tanks, with or without planed joints, Columns, Girders, Special Castings, required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

Note.—Syphons and Covers are joint-faced if required, doing away with millboard and iron boring, or Syphons made without Covers, a socket being cast on and fitted with a small plug about 6 inches in diameter with lead joint. In either way preventing leakage.

GEORGE'S
Patent Gas Calorigen,
A STOVE FOR
WARMING AND VENTILATING.
Recommended by Dr. Richardson.

Manufacturers:
J. F. FARWIG & CO.,
36, QUEEN STREET, CANNON ST., LONDON.

ERECTION of CHEMICAL PLANT.

SULPHATE OF AMMONIA APPARATUS.
Continuous Method.
Improved "Coffey Still" Process and other Methods.

Apparatus for Making Gray or White Sulphate of Ammonia from Nitrogenous Bodies.

Models of above plant supplied, price £3 10s. and £6 10s., or plans at moderate rates. Assistance given to persons making experiments.

JOHN G. HARVEY, 84, Cobourg Street, Leeds.

Gold Medal Awarded, Paris Exhibition, 1878.

THOMAS TURTON AND SONS,
SHEAF AND SPRING WORKS,
SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS,
STEEL OF ALL DESCRIPTIONS,
SCREW STOCKS, TAPS, AND DIES, SPANNERS,
RATCHET BRACES, LIFTING-JACKS,
ANVILS, VICES,
AND ENGINEERS TOOLS GENERALLY.
LONDON OFFICE:
90, CANNON STREET, E.C.

THE

MANN & WALKERS' PATENT SCRUBBER.

Extensive use.

The successful and extensive use of the Mann and Walkers' Patent Scrubbers in all parts of the world has demonstrated their advantages, and entitled them to be received with credit and confidence. The number of them in use is about twenty times that of any other known means of purifying gas from ammonia.

Small quantity of Water required.

By a very small quantity of clean water (not more than 5 or 6 gallons per ton of coals carbonized) the whole of the Ammonia contained in the Gas is completely absorbed; the Gas, after only once passing through, issuing from the Scrubber outlet completely purified from Ammonia. The Scrubber gives no appreciable back pressure.

Residual Product obtained.

The Residual Product—namely, the Ammoniacal Liquor—is obtained at from 20 to 30 ounces commercial strength, which enables it, after being mixed with the weaker Liquor from the hydraulic main and condensers, to be sold to the Manufacturing Chemists, or converted into Sulphate, at the degree of strength found most profitable to the Gas Company.

Illuminating power increased.

The Scrubber is a Saturator, and the Gas being soaked in this strong solution of Ammonia in the lower columns of the Scrubber, is purified from a large amount of Carbonic Acid, and its Illuminating Power is thereby increased.

Small amount of power required.

The friction is so little, and the motion so slow, that the power necessary to work the Scrubber is almost inappreciable. A small gas-engine will work a pair of Scrubbers, purifying 2 million cubic feet of gas per day.

Beckton Gas-Works.

There are thirty of these Patent Scrubbers in the Beckton Gas-Works, equal to purifying 30 million cubic feet per day, and the total amount of engine power necessary to work the whole 30 is not equal to that given out by one 10-horse engine.

Reserve purifying power contained.

There is also a most important advantage arising from the height of these Scrubbers, in the reserve force contained in them. In the event of any stoppage, the mass of soaked and wetted material would continue the purification for hours, even if the supply of water and working were stopped from any cause.

Internal Materials not changed.

The changing of the soaking materials in these Scrubbers is very seldom required; they are well known to remain in action for seven years without being emptied.

Guarantee

They are in all cases erected under guarantees; they easily fulfil the stipulations of any Act of Parliament, and the chemical restrictions of the Board of Trade; and in cost they are much less to a Gas Company than any other known means of purifying Gas from Ammonia.

C. & W. WALKER.

8, *Finsbury Circus, London, E.C.*

F. & C. OSLER,

45, OXFORD STREET, LONDON, W.

MANUFACTORY AND SHOW-ROOMS:

BROAD STREET, BIRMINGHAM.

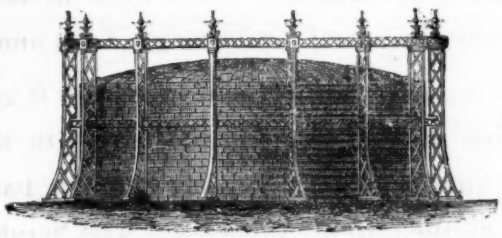
ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS,

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

6, WESTMINSTER CHAMBERS, VICTORIA STREET,

GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

MAKERS OF ROOFS, BRIDGES, &c.

S. OWENS & CO.,

WHITEFRIARS STREET, FLEET STREET, LONDON, E.C.,

Hydraulic Engineers,

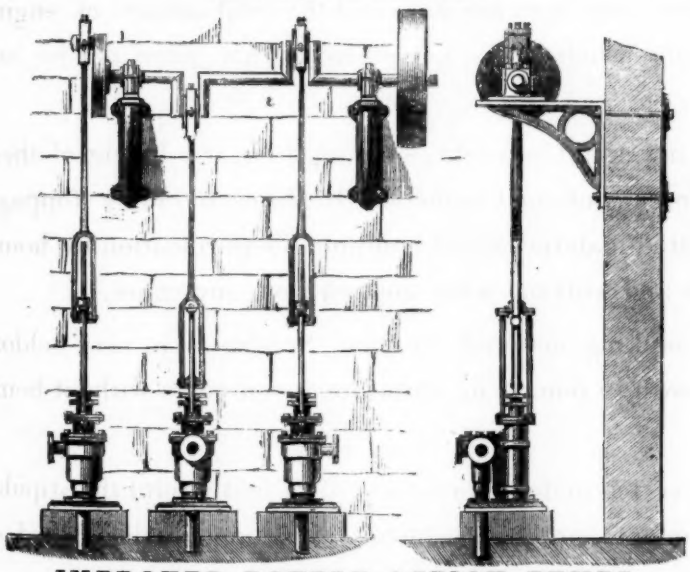
AND MANUFACTURERS OF

PUMPING MACHINERY of every Description.

SOLE LICENSEES AND MANUFACTURERS FOR GREAT BRITAIN OF

BLAKE'S PATENT DIRECT-ACTING STEAM-PUMPS.

MORE THAN 13,000 IN USE.



IMPROVED DOUBLE-ACTION PUMPS.

For Water. For Tar. For Ammoniacal Liquor.

This illustration shows an arrangement of three (No. 179) Improved Double-Action Pumps driven from the same crank-shaft, as frequently supplied for use in Gas and Chemical Works. The suction and discharge pipes can be arranged for drawing from and delivering in any required direction

These Pumps have been supplied to nearly all the large Gas Companies and Chemical Works, both for Pumping Water, Tar, and Ammoniacal Liquor.

GAS SYPHON PUMPS, IN COPPER OR SHEET IRON, ALWAYS IN STOCK.

Illustrated Catalogues sent post free on application.

T. NEWBIGGING,

CONSULTING GAS ENGINEER,

5, NORFOLK STREET, MANCHESTER.

HENRY LYON,

MECHANICAL AND CONSULTING GAS ENGINEER,

NORWOOD, NORTHENDEN ROAD,

SALE, NEAR MANCHESTER.

ALFRED LASS,

Fellow of the Institute of Chartered Accountants,

SPECIAL ACCOUNTANT FOR GAS AND WATER UNDERTAKINGS,

30, GRACECHURCH STREET, LONDON.

Accounts Analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.

The Forms of Account, which have been specially designed by Mr. Lass to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, Corporations, and Local Boards.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

AND

CANNEL COAL FACTOR,

30, St. Andrew Square, EDINBURGH.

Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

MR. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

ANALYSIS AND PRICES FORWARDED ON APPLICATION.

THOMAS PROUD,

BROOKFIELD WORKS,

103, ICKNIELD ST., BIRMINGHAM,

MANUFACTURER OF

WOOD GRIDS

FOR

PURIFIERS AND SCRUBBERS,

AND

GENERAL STEEL AND IRON TOOLS AND MATERIAL USED IN GAS-WORKS.

BOX'S PATENT STREET GAS-LAMP

Has the following good qualities:—

1. No putty or other material is required for glazing. Thus there is no hacking out of old putty on removal of the glass, with the *consequent damage* to the lamp frames. 2. No liability to breakage by unequal expansion of the glass caused by changes of temperature. 3. Any inexperienced workman can glaze the lamp in a few minutes. 4. The system of glazing can be applied to any existing lamp at a trifling cost. 5. It is cheap, strong, and durable. 6. The glass can be easily removed so that the frames can be thoroughly painted inside and out.

The lamp may be supplied fitted with clear opal or ribbed glass, *as also with enamel tops* if required. The necessary fittings for altering existing lamps to this system can be supplied at moderate prices and a small charge for royalty. Licences granted on the most reasonable terms. For further particulars apply to the Patentee, W. W. Box, Gas-Works, Crayford, Kent.

RETORT BOLTS,

AND ALL KINDS OF

BOLTS AND NUTS,

SUITABLE FOR

GAS-WORKS,

SUPPLIED BY

JOHN STANSFELD,

Bolt & Nut Manufacturer,

ALFRED ST., BOAR LANE, LEEDS.

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

198, ST. VINCENT STREET, GLASGOW.

TREES BOGHEAD.

SHOTTS BOGHEAD,

And all the first-class Scotch Cannels.

Prices and Analyses on application.

HEBBURN MAIN GAS COAL.

This Coal is now highly approved of for gas making, and yields over 10,000 feet per ton of 15-candle gas, and about 14 cwt. coke.

For references and prices, either f. o. b. or by rail, apply to

W. RICHARDSON,

29, QUAYSIDE, NEWCASTLE-ON-TYNE.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17¼ candles.

One ton yields 12¾ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

GAS COAL.

THE MIRFIELD COAL COMPANY are supplying GAS COAL of the best quality on trucks at their siding. This Coal contains 10 per cent. of Cannel, and, as analyzed by Mr. James Paterson, of Warrington, yields 12,600 *cubic feet of* 16·67-*candle gas, with* 1430 *lbs. of good Coke, per ton.* Ash in Coke, 1·88.

Apply to the MIRFIELD COLLIERY, Mirfield, NORMANTON. London Agent: MR. F. J. LEE SMITH, Bromley, KENT.

WOOD **TROUGHING**

For Preserving Service-Pipes.

Price from Three-Farthings per Foot, In any Lengths.

THOS. PROUD,

Brookfield Works, Icknield St., Birmingham.

STEPHEN HOBBS,

OF

CLARENCE VILLA, RAMSGATE,

CONTRACTOR FOR WELL SINKING

AND

SEWERING WORK GENERALLY,

Begs to inform Engineers and others that he has just completed the extensive and important excavations, amounting to 4000 cubic yards, for the Ramsgate Improvement Commissioners (under the direction of their Engineer, Mr. Valon), whereby a good and abundant supply of water has been obtained, and is now in a position to undertake further work in town or country.

References kindly permitted to be made to MR. WILLIAM A. VALON, C.E., RAMSGATE. Additional testimonials if required.

IMPORTANT to GAS COMPANIES.

ENORMOUS SAVING.

JOHN ABBOT & CO., LIMITED,

OF SUFFOLK LANE, LONDON, AND GATESHEAD,

Manufacture and Erect

HYDRAULIC CRANES

For Discharging Coal Barges;

WAGGON HOISTS

For Lifting Coals to Retort-House Stageway;

CAPSTANS

For Moving Trucks about the Yard,

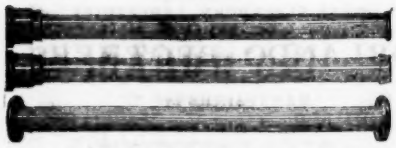
And Apparatus for Lifting PURIFIER COVERS.

Examples to be seen at Beckton, Hull, &c., &c.

WILLIAM MACLEOD & CO.,

30, ST. ENOCH SQUARE, GLASGOW.

CAST-IRON GAS AND WATER PIPES.



Sole Agents in Scotland for the Torbay Paint Co.

Prices on application.

FERRAND DAVIES,

148, GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.,

AGENT FOR

THOMAS BARR'S LESMAHAGOW MAIN CANNEL,

AND

NEWTON, CHAMBERS, & CO.'S SILKSTONE GAS COALS.

Analyses and Quotations on application.

WILSON CARTER AND PEARSON,

GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or for Export all kinds of Fuel for Gas purposes.

Address—**CHIEF OFFICES.**

TEMPLE BUILDINGS, 50, NEW STREET, BIRMINGHAM.

GEORGE ANDERSON,

GAS AND CONSULTING ENGINEER,

35A, GREAT GEORGE STREET,

WESTMINSTER, S.W.,

PATENTEE and MANUFACTURER of the following Inventions:—

RETORT SETTINGS—giving great Economy of Fuel.

STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES, WASHERS, SCRUBBERS.

FUEL-MACHINE, for Compressing Breeze and Tar.

N.B.—Pamphlet, with Twenty-Eight Illustrations and Letterpress, on the Construction of Gas-Works, will be sent, post free, on receipt of 4s. in stamps To be had of the AUTHOR; or at the Office of the "JOURNAL OF GAS LIGHTING."

PRICES AND ALL PARTICULARS TO BE HAD OF THE PATENTEE,

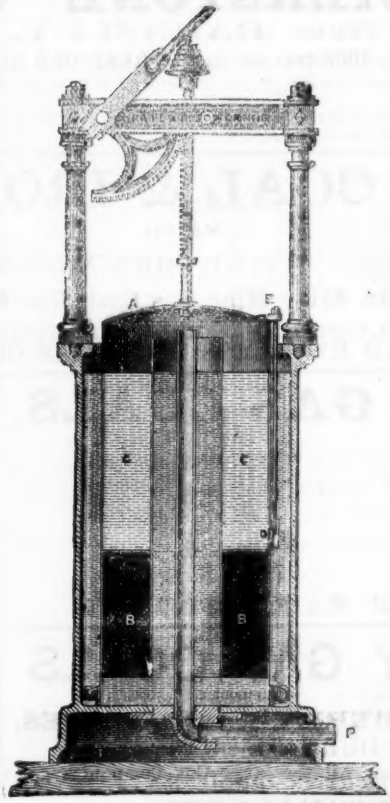
35a, GREAT GEORGE STREET, WESTMINSTER, S.W.

GEORGE WALLER & CO.,

GAS AND HYDRAULIC ENGINEERS,

Patent Compensating Steam Governor,

WITH SELF-CONTAINED WATER-BALANCE.



This is the most efficient and perfect Governor yet made to control and regulate the speed of Engines and Exhausters according to the varying make of gas, and maintain a steady gauge, whether working level or with six inches of seal.

It is the only Governor that will effectually control Condensing and Compound Engines, especially when the Exhauster is on light work, and the Engine is large.

During the drawing and charging of Retorts, the Engine requires no attention—a matter of great importance in small works.

Descriptive Circular sent on application.

They are in use at

BECKTON,
HAMPTON WICK,
DUKINFIELD,
HARTLEPOOL,
NEWCASTLE-ON-TYNE,
RAMSGATE,
SUTTON,

and about 30 other works.

G. W. and Co. make **special Steam Throttle Valves,** suitable for working with this Governor, and alter existing Throttle Valves to same plan.

See also advertisement, page 581.

PHŒNIX ENGINEERING WORKS,

Holland Street and Bear Gardens, Southwark, S.E.

WARNER'S RETORT-HOUSE MACHINERY.

[*As Illustrated and Described in the* JOURNAL *for May* 4.]

Communications to be addressed to

W. J. WARNER, GAS-WORKS, SOUTH SHIELDS.

GAS *v.* ELECTRIC LIGHT.

WIGHAM'S PATENT LIGHTHOUSE GAS-BURNERS,

For Street Lighting and the Illumination of Large Halls, Factories, Ship Yards, &c., where Powerful Light is required

These Burners have been adopted by a School Board, having large school-rooms in charge, because of their high illuminating power and the facilities they give for perfect ventilation. The actinic power of these Burners is such that they are used successfully for Photography and Photo-Lithography.

SOLE MANUFACTURERS:

J. EDMUNDSON & CO., Gas Engineers, 19, GREAT GEORGE STREET, WESTMINSTER, LONDON, S.W.

NO MORE WASTE LIME! SAVE THE VALUABLE PRODUCT!

G. R. HISLOP'S PATENT REGENERATIVE PROCESS

Most Effectively and Economically restores this waste *ad infinitum*.

The Patentee having devoted more time and attention to this subject than perhaps any other person living, is now in a position to recommend the adoption of this process to Gas Companies and Corporations with the utmost confidence in its practical utility, convenience, and economy. 1st. It restores the spent Lime at from one-third to one-half its original cost, apart from its undoubted convenience and the economy of space. 2nd. There is practically no limit to the duration of the Lime. 3rd. The cost of apparatus for the introduction of the process is very moderate and exceedingly durable. 4. The Patentee supplies special bricks and castings, erects and proves the process on the most favourable terms.

The process, in operation, may be seen at the Corporation Gas-Works, Paisley, where the Lime has been restored 120 times. Inspection is cordially invited.

For Terms, apply to GEO. R. HISLOP, F.C.S., Engineer, Gas-Works, PAISLEY, N.B.

ALDWARKE MAIN AND CAR HOUSE COLLIERIES,

Near ROTHERHAM.

JOHN BROWN & CO., LIMITED,

ATLAS STEEL AND IRON WORKS, SHEFFIELD.

PROPRIETORS.

The Aldwarke Main Brights is a first-class gas-making and coking Coal, yielding by analysis 12,600 feet of 19-candle gas per ton, and giving "Weight of illuminating matter in lbs. of sperm, 820·80." It is very free from impurities and foreign matter.

Copies of Analyses made by Gas Companies who have used it will be forwarded and Samples sent on application.

GAS COAL. GAS COAL. GAS COAL.

WELLS, BIRCH, RYDE, and CO., Limited,

HOYLAND SILKSTONE COLLIERIES,

Near BARNSLEY.

This Company is now in a position to raise **2000 tons per day of REAL OLD SILKSTONE GAS COAL.**

"The quality of this Coal for Gas purposes, if equalled, is not excelled by any on record, and the Coke competes successfully with best Durham."—See *Mining Journal*, Aug. 11, 1877.

Prices quoted to any Railway Station, or F.O.B. Hull, Grimsby, Goole, Keadby, Liverpool, and Fleetwood.

Full particulars will be sent on application to above address.

THE WIGAN COAL & IRON COMPANY,

LIMITED.

MIDLAND DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: A. C. SCRIVENER,

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

CANNEL AND GAS COALS.

THE DUKINFIELD COAL AND CANNEL COMPANY are prepared to deliver, to any Station, their Celebrated GAS COALS, which have a very high reputation for quantity of Gas and Illuminating Power, and make a First-class Coke.

Analyses and terms of delivery may be obtained by communicating with the above Company, at their Offices,

DUKINFIELD, NEAR MANCHESTER.

LONDONDERRY GAS COALS

DIRECT FROM THE

MARQUESS OF LONDONDERRY'S COLLIERIES.

COUNTY OF DURHAM.

For Prices and Particulars, apply to

MR. S. J. DITCHFIELD,

LONDONDERRY OFFICES, SEAHAM HARBOUR, COUNTY OF DURHAM.

London Agents: Messrs. LAMBERT BROS., 85, GRACECHURCH ST., E.C.

JAMES NEWTON & SONS,

(Established 1820,)

FIRE-BRICK AND TILE MERCHANTS,

Wholesale and for Exportation,

FALCON DOCK, 78 AND 79, BANKSIDE,

SOUTHWARK, LONDON, S.E.,

DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for

GAS AND WATER WORKS.

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

(ESTABLISHED 1835.)

ORLANDO BROTHERS,

LIMITED,

MANUFACTURERS OF

PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES,

BENDS, JUNCTIONS, &c.

Fire-Bricks, Tiles, Blocks, and Chimney-Tops.

NEW PATENT WET GAS-METER,
THE "RELIANCE,"

MANUFACTURED BY THE

GAS-METER COMPANY, LIMITED,

238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

SOLE AGENT FOR SCOTLAND: JAMES KEITH, EDINBURGH AND ARBROATH.

The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

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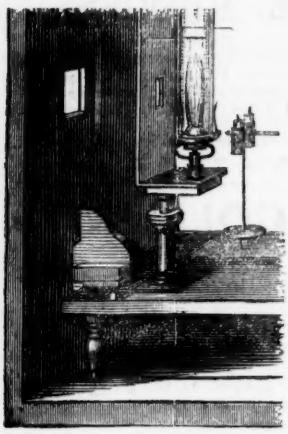

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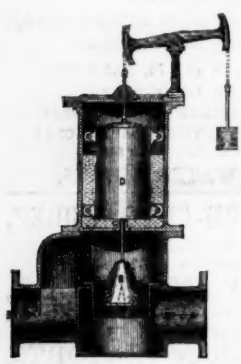

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